Ontario

ONTARIO GEOLOGICAL SURVEY

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Report of Activities, 1999
Resident Geologist Program

Kirkland Lake Regional Resident Geologist Report:
Kirkland Lake and Sudbury Districts

by

G. Meyer, M. Cosec, G.P.B. Grabowski, D.L. Guindon, E.C. Chaloux and M. Charette

2000

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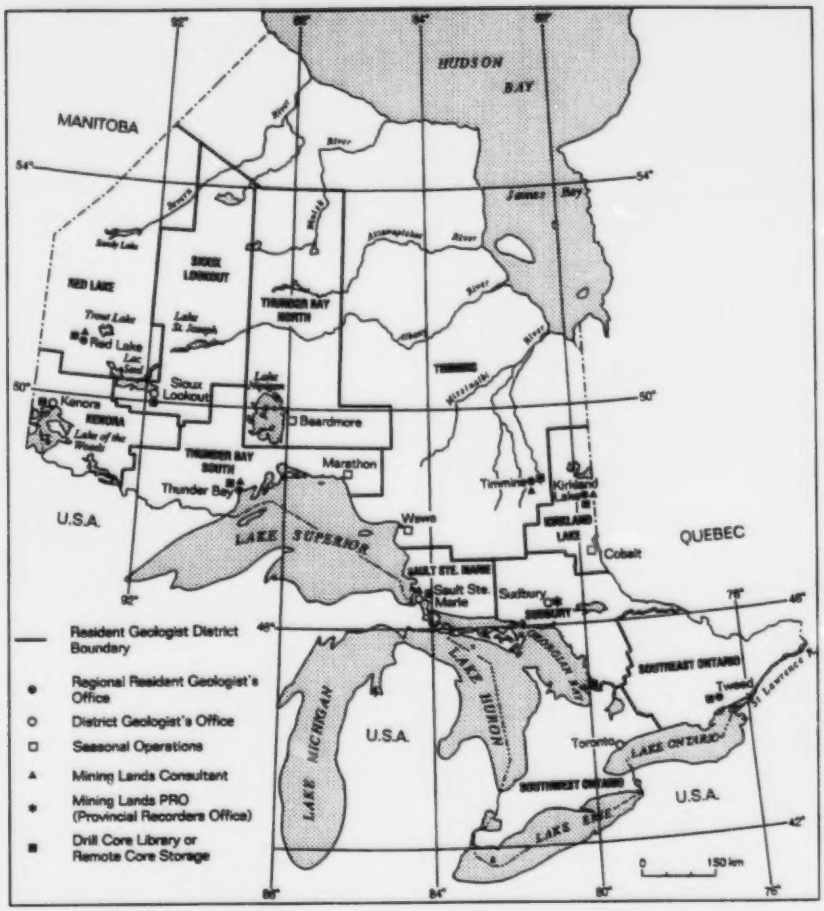

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ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM

REPORT OF ACTIVITIES–1999

KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST REPORT

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by

G. Meyer, G.P.B. Grabowski, D.L. Guindon and M. Charette

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KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST (KIRKLAND LAKE DISTRICT)–1999

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INTRODUCTION

The gold price was below US$300 for most of 1999. This, and several other factors, kept exploration activity in the Kirkland Lake Resident Geologist's District at a low level. Kinross Gold Corporation placed the Macassa Mine on care and maintenance. Fortunately, some jobs were retained at the Macassa mill, which is now custom milling ore from Exall Resources Limited's and Glimmer Resources Inc.'s Glimmer Mine. It is the first time in the history of gold mining along the Larder Lake break that all gold mining has ceased in the Kirkland Lake – Virginiatown gold camp. In the Kirkland Lake Resident Geologist's District, gold mining is at present restricted proximal to the Destor-Porcupine Fault Zone with two mines operating east of Matheson and another two in Holloway Township.

Total gold production in 1999 from all producers in the Kirkland Lake district (see Mining & Milling Activity – Precious Metals in this report) was 303 858 ounces of gold. This represents a decrease of 19% from 1998. Total historic gold production in the Kirkland Lake Resident Geologist's District, including most of the former Cobalt Resident Geologist's District, is 40 557 977 ounces of gold recovered from 132 953 353 tons of ore and 192 501 ounces of gold from 4 168 925 tons of tailings. In addition, an underground barite mine and an open pit hedmanite mine operated in the Kirkland Lake Resident Geologist's District in 1999.

St Andrew Goldfields Ltd. fast tracked the West Zone project on the Hislop Mine property. Open pit mining commenced on July 22, 1999.

Millstream Mines Ltd. completed several deep holes to test the down dip/plunge copper, zinc and cobalt potential at the Potter Mine (past producer) in Munro Township.

The Kirkland Lake Regional Resident Geologist's District experienced a reduction in the level of exploration activity throughout 1999. There were 187 active exploration projects (Tables 3 & 4). 410 Assessment Work records were processed and incorporated into the Assessment File system as well as 13 OPAP reports (Table 3). In addition, 66 literature titles were added to the library database (Table 6).

80 Ontario Prospectors Assistance Program (OPAP) projects were designated within the Kirkland Lake Resident Geologist's District at an estimated value of nearly $ 1 200 000. The program will be discontinued in 2000.

Approved exploration expenditures filed for assessment work in the Kirkland Lake Regional Resident Geologist's District in 1999 totaled $ 11 119 663.

MINING & MILLING ACTIVITY – PRECIOUS METALS

Barrick Gold Corporation – Holt-McDermott Mine

In 1999, Barrick Gold Corporation's Holt-McDermott Mine in Holloway Township mined and milled 554 530 tons to produce 108 081 ounces of gold (recovered grade of 0.195 ounce Au per ton) at a mill recovery rate of 96.1%. Production cost per ounce of gold was US$139.00. Ore reserves at the end of December 31, 1998 in the proven and probable categories were 3 022 000 tons grading 0.202 ounce Au per ton (611 000 ounces of gold). In addition, the company identified 2 444 000 tons in the mineralized material category grading 0.151ounce Au per ton (370 000 ounces of gold).

Underground development amounted to 3440 m drifting and 435 m raising. Capital expenditures were US$8.5 million. To access deeper gold ore reserves, shaft deepening was completed to a designed depth of 1196 m. Production levels were established at 925 m and 1075 m and drifting advancing 418 m and 361 m, respectively.

Underground exploration added new reserves in the Hinge area, below the South Zone and the Central Zone. In the year 2000, the company is planning to explore the western extensions of both the South Zone and West Zone, and drill below the 1075 level to test for ore along the Ghostmount fault zone. A total of 9400 m of underground diamond drilling is planned at a budgeted cost of $375 000.

At end of 1999 the company employed 184 people. (www.barrick.com and Craig Todd, Barrick Gold Corporation, personal communication, 2000).

Battle Mountain Gold Company and Teddy Bear Valley Mines Limited – Holloway Mine

Battle Mountain Gold Company and Teddy Bear Valley Mines Limited's, Holloway Mine in Holloway Township, processed 487 317 t (537 175 tons) of ore, from which 107 780 ounces of gold were recovered (recovered grade of 0.20 ounce Au per ton). Compared with 1998, the tons of ore milled were up by less than 1% and gold production was up by 11%. The ore was custom milled at the following three area mills: 379 970 t of ore at Barrick Gold Corporation's Holt-McDermott mill produced 85 912 ounces of gold at a recovery of 95.41%, 50 069 t at St Andrew Goldfields Ltd.'s Stock mill produced 9353 ounces of gold at a recovery of 93.97% and 48 356 t at the Horne smelter in Rouyn-Noranda produced 10 620 ounces of gold at a recovery of 95.32%. Ore reserves at the mine are 4.076-million t grading 6.5 g/t gold.

During 1999, the joint venture partners completed 5278 m drifting and completed raises to permit changes to the ventilation system.

Exploration drilling, totaled 19 347 m and definition drilling 21 417 m. A portion of the mine between 780 to 1200 m depths was explored and there were minor increases in ore reserves.

Capital expenditures for the year amounted to $4.7 million. In 2000, the companies plan to spend $800 000 on underground exploration. Development and diamond drilling will be on the western part of the orebody on the 505-m and 650-m levels.

At the end of December 1999, consecutive days without lost-time to accidents stood at 1248.

At year-end, the companies employed 140 people (www.bmgold.com and R.J. Labine, Battle Mountain Gold, personal communication, 2000).

Canmine Resources Corporation

Canmine Resources Corporation purchased Cobatec Inc.'s cobalt-nickel processing facility, near Cobalt, which had gone into receivership in 1998. The company signed an agreement with Agnico-Eagle Mines Ltd. to acquire a cobalt-silver stockpile estimated to contain between 1.76 and 3.12 per cent cobalt and 41ounces of silver per tonne. The stockpile, estimated to be over 13 000 tonnes, is capable of feeding the plant for two to three years. The acquisition of this stockpile will facilitate the re-start of the plant on a low unit cost of production. It also provides the company a base on which to plan mine development at its Werner Lake cobalt and Maskwa nickel projects (in northwestern Ontario and Manitoba, respectively) before processing the ores at the Cobalt plant (www.canmine.com; Northern Daily News, January 22, 2000).

Exall Resources Limited and Glimmer Resources Inc. – Glimmer Mine

The Glimmer Mine, operated by Exall Resources Limited, is located 8 km east of Matheson in Hislop Township. Commercial production commenced on New Years Day 1998. In 1999, ore mined was 258 699 t (285 167 tons) to produce 46 550 ounces of gold at a recovered grade of 0.163 ounce Au per ton. Milling was performed at two area mills. 203 292 t of ore were milled at St Andrew Goldfields Ltd's Stock mill to produce 35 481 ounces of gold at a recovered grade of 0.175 ounce Au per ton and a recovery rate of 97.06% and 55 407 t of ore were milled at Kinross Gold Corporation's Macassa mill producing 11 069 ounces of gold at a recovered grade of 0.20 and a recovery rate of 97.11%. In late 1999, Exall cancelled its custom milling contract with St Andrew in favour of Kinross Gold's Macassa mill.

Mineable reserves in all categories on May 31, 1999 were 1 232 307 t grading 8.9 g/t or containing 352 789 ounces of gold. In addition, the company calculated resources in all categories to contain 979 932 t grading 4.22 g/t or containing 133 099 ounces of gold. Total reserves plus resources were 2 212 239 t grading 6.83 g/t (containing 485 888 ounces of gold).

Underground workings are accessed by a spiral decline ramp to a vertical depth of 190 m. During 1999, the company completed 262 m of decline advancement, 3004 m drifting, 35 m vent raise excavation, 2948 m surface drilling in 11 holes and 19 645 m underground drilling in 183 holes.

Underground exploration drilling and drifting confirmed the extension of the mineralized envelope from the extreme east of the mine to the extreme west of the mine through the Central Zone. The mineralized zone is open on strike in both directions and down dip.

In 2000, Exall plans to explore the extension of ore zones below the 270-m elevation with a budget of $1 000 000.

At year-end, the mine employed 81 people (www.exall.com and M. Hoxha, Exall Resources Limited, personal communication, 2000).

Kinross Gold Corporation – Kirkland Lake Operation

Kinross Gold Corporation placed the Macassa Mine on care and maintenance in June 1999 and 160 employees were laid off. Fortunately, 24 jobs were retained at the Macassa mill, which is now custom milling ore from Exall Resources Limited's and Glimmer Resources Inc.'s Glimmer Mine.

Kinross Gold Corporation's Kirkland Lake operation, in 1999, produced 37 665 ounces of gold. The source of the 1999 ores and gold recovery is as follows:

1. 57 891 tons of Macassa ore produced 22 484 ounces of gold (or a recovered grade of 0.388 ounce Au per ton) at a recovery rate of 95.61%
2. 18 650 tons Lake Shore crown pillar ore produced 3593 ounces of gold (or at a recovered grade of 0.193 ounce

Au per ton)

3. 215 344 tons of Lake Shore tailings produced 11 588 ounces of gold (or at a recovered grade of 0.0538 ounce Au per ton) at a recovery rate of 64.48%

In addition, the Macassa mill processed 55 407 t of Glimmer Mine ore (see section on Exall Resources Limited and Glimmer Resources Inc. in this report).

As a precaution, following the completion of the Lake Shore tailings and crown pillar projects, an opening was left near the base of the Kirkland Lake Basin. This opening is connected to underground workings and is intended to circumvent the possibility of water build-up. This measure removes any potential for sudden flooding of the underground workings at the Macassa Mine from surface water.

The Lake Shore tailings reserves were depleted on October 15, 1999.

No. of employees at year end were 24 (www.macassa.com and L. Desmarais, Kinross Gold Corporation, personal communication, 2000).

SMC (Canada) Ltd. – McAlpine Mill

SMC (Canada) Ltd., a subsidiary of Sabin Metal Corporation of East Hampton NY, continued to operate the McAlpine mill (formerly Agnico Eagle-Mines Limited's Penn mill purchased in 1998). The mill, consisting of a 200-ton per day gravity-flotation circuit, processes material from waste electronic and microelectronic gear, jewelry, photographic and x-ray film, slag, crucibles, refractory brick and any other products which may contain precious metals.

St Andrew Goldfields Ltd. – Stock, Taylor and Hislop Mines

St Andrew Goldfields Ltd. has a 1300-t per day CIP mill located in Stock Township in the Timmins Regional Resident Geologist's District, 22 km west of Matheson and three permitted mine sites. The gold deposits of the Stock, Taylor, and Hislop mines occur within or are proximal to the Porcupine-Destor Fault Zone. Since 1989, St Andrew produced 157 782 ounces of gold from its Stock and Hislop mines and completed an exploration shaft at the Taylor Mine property to a depth of 215 m.

Early in 1999, St Andrew Goldfields Ltd. focussed on identifying gold resources that could be brought into production easily. The West Zone of the Hislop Mine, located 14 km southeast of Matheson, was identified and open pit mining at a design rate of 15 000 t per month commenced on July 22, 1999. By the end of the year, 45 382 t (50 025 tons) of Hislop ore were processed at the company's Stock mill to produce 117 647.34 grams of gold or 3782.45 ounces of gold (recovered grade of 0.0756 ounce Au per ton). Mill recovery was at 72.3%. In 1999, 325 847 tons of overburden and 90 060 tons of waste rock were removed. A total of 4514 m of diamond drilling in 59 holes were completed in the West Zone area in 1999, bringing the total diamond drilling of the zone to more than 16 000 m in 176 holes. Ore reserves at the end of 1999 were 161 500 t grading 4.04 g/t Au. At year-end, the open pit measured 320 m long by 120m wide and 64 m deep. The pit will eventually reach a depth of 80 m. A total of 423 000 t of overburden and 741 000 t of waste rock will be removed over the life of the open pit to give a ratio of 2.27:1 for rock and 5.6:1 for a combination of overburden and rock.

St Andrew Goldfields Ltd. also drilled 1517 m in 5 holes to test other targets on the Hislop Mine property. Other exploration activity on the property include sampling and analyses of 1823 soil samples and 144 tree twig samples.

The contract to process Glimmer Mine ore at the Stock mill between St Andrew Goldfields Ltd. and Exall Resources Limited, was cancelled in June, 1999. This created excess mill capacity, which has been replaced by mill feed from the Hislop open pit mine.

The company recently completed two financings that put $2.8 million in its treasury to improve the company's working capital position, provide funds to finance the re-commencement of production at the Stock Mine and to complete a feasibility study on the Taylor Mine project. The company's financial position is anticipated to show improvement because of expected revenues and operating cash flows due to mining operations at Hislop and Stock, which together will produce approximately 700 t of ore per day. With the company's own production and the existing custom mill feed, the current 1300 t per day capacity of the Stock mill will be fully utilized.

The ultimate objective of St Andrew is to bring the 1-million ounce Taylor Gold Mine into production. Three diamond drill holes totaling 668.7 m and 9 holes totaling 2117.45 m were completed at the Taylor Mine area and West Porphyry Zone, respectively.

A budget of approximately $75 000 to $ 100 000 is anticipated for the Hislop Mine property in 2000.

The number of employees at the Hislop Mine site is 12 and at the Stock mill 29. Total number of employees is 84 (www.standrewgold.com and K.A. Jensen, St Andrew Goldfields Ltd., personal communication, 2000).

MINING ACTIVITY – INDUSTRIAL MINERALS

Extender Minerals of Canada Ltd.

Extender Minerals of Canada Ltd. produced approximately 15 000 tons barite in 1999. The mine site in Yarrow Township provided feed for the mill in Powell Township. Remaining reserves at the Yarrow mine will provide mill feed for approximately one year's production (R. Hill, Extender Minerals of Canada Ltd., personal communication, 2000).

Hedman Resources Ltd. – Hedman Mine & Mill

Hedman Resources Ltd. produced 1450 t of hedmanite, a lizardite mineral filler, from its open pit in Warden Township. Proven reserves at the mine are approximately 9 million t. In 1999 the company employed up to 7 people and 2 at head office (R.F. Bertrand, Hedman Resources Ltd., personal communication, 2000).

Hedman Resources Ltd. announced the development of a $3 million, 10 000 square foot manufacturing facility, which is expected to be operational by May 2000. Superfil, the company's main product, will be marketed under the brand name Firefelt. The new plant will produce 1.5 million square metres of Firefelt products annually. These products are made up of heat resistant materials, which are intended to replace asbestos. The product will be sent to 10 countries and will have 20 different applications. Revenues from the new line of products are expected to exceed $6.7 million with an operating cost of just under $3 million. The spin-off to the existing plant will create 35 additional full- and part-time jobs. During the construction phase 50 new full- and part-time jobs will be created (The Daily Press, October 23, 1999).

ADVANCED EXPLORATION - INDUSTRIAL MINERALS

Extender Minerals of Canada Ltd. – North Williams Township

Extender Minerals of Canada Ltd. continued deepening a decline ramp to assess the potential of a barite vein on the company's North Williams Township property. Approximately 1500 feet of heading has been completed to date. Where the decline ramp intersects the vein, the development material is being assessed. The barite vein is a minimum of 500 feet long and 7 to 9 feet wide grading approximately 98 to 99% $BaSO_4$ (R. Hill, Extender Minerals of Canada Ltd., personal communication, 2000).

EXPLORATION ACTIVITY

Atapa Minerals Limited

Atapa Minerals Limited started a four-hole, 14,100-feet, drill program on its Doherty Cooper property in Gauthier Township. The company has the option to acquire up to a 100% participating interest in the property from DCM Gold Ltd. (Mining North, May 1999, p 5, www.atapa.com).

Armistice Resources Ltd. – Armistice Property

Armistice Resources Ltd. is currently offering a flow through share offering of 50 units at $10,000 per unit. If successful, $500,000 will be raised. Armistice has been able to keep the underground workings dewatered. The company is also entertaining the idea of bringing in a partner on the project (Northern Daily News, November 26, 1999, p.1).

Battle Mountain Gold Company

Battle Mountain Gold Company outlined a 400,000 ounce gold resource, within a large alteration zone, on the Teddy Bear property, where Battle Mountain has 100% interest. The same alteration zone hosts its Holloway Mine. Battle Mountain had 2 drills active on surface and plans to conduct underground drilling beginning in May (Battle Mountain Gold Press Release, April 30, 1999, http://www.bmgold.com/).

Blackstone Development Inc.

Blackstone Development Inc. announced drill results on the Whitney Lake property co-owned by prospectors, G. Chitaroni, M. Leahy and F. Kiernicki. Diamond drill hole WL-4-99 intersected 2 zones assaying 0.307% Ni, 0.125% Cu 0.025% Co, 0.85 g/t Ag, 0.07 g/t Pd and 0.03 g/t Pt over 2.0 m and 0.445% Ni, 0.275% Cu, 0.028% Co, 1.42 g/t Ag, 0.11 g/t Pd and 0.04 g/t Pt over 5.5 m (Blackstone Development News Release September 11, 1999).

Boulder Mining Corporation

Boulder Mining Corporation continued its exploration program on the Barnet property in Barnet Township. The 1998 exploration program confirmed 2 gold zones and identified 2 more. One of the zones is associated with a 50-100 m wide by 700 m long lower magnetic susceptibility area. Initial exploration consisted of cutting intermediate lines, detailed geological mapping and prospecting and detailed magnetic surveys over the showings in order to define diamond drill targets for the next phase. The exploration budget for the groundwork and diamond drilling is between $50 000 and $75 000 (Boulder Mining Corporation Press Release, June 6, 1999). Four drill holes were completed. One hole intersected 4.02 ppm Au over 6.5 m (Northern Daily News, September 11, 1999, p. 1).

Expatriate Resources Ltd.

Expatriate Resources Ltd. has granted Echo Bay Mines Ltd. an option to earn a 65% interest in the Cook JV properties. They consist of the Russel Creek property in Bowman Township and the Watabeag property, located 10 km to the west in Currie Township. Overburden drilling, in the 1980's, on the Russel Creek property returned anomalous gold values of 5800 to 416,000 ppb gold in heavy mineral concentrates of basal till material, in six holes. Three follow-up diamond drill holes failed to locate a bedrock source for the gold (www.expatriateresources.com – Expatriate Resources, News Release, November 17, 1999).

Goldeye Explorations Limited

Goldeye Explorations Limited announced results of Borehole IP and Deep-IP surveys, completed on the Goldeye zone, a gold mineralized zone in Tyrrell Township containing a resource of 530 000 tons grading 0.13 ounce gold per ton. The Borehole IP survey indicates that the Goldeye zone is characterized by coincident strong chargeabilities and resistivities over 400 m horizontally and 400 m vertically. Drilling indicates the zone to be 40 m thick. The Deep-IP survey identified two strong anomaly trends; the stronger of the two, with an associated resistivity high, correlates with the Goldeye zone. The survey indicates the Goldeye zone has a depth extent of 780 m and a strike length of 400 m. Deep-IP surveys over the Big Dome zone, situated 1.5 km to the southeast of the Goldeye Zone along the Tyrrell Structural Zone, indicates that the high-grade gold mineralization intersected in hole G-98-9 (149.3 g/t Au over 1.4 m) and G-98-7 (9.2 g/t Au over 0.9 m and 6.4 g/t Au over 0.6 m) is also characterized by similar distinctive, strong chargeability/high resistivity responses over a 300 m strike length (Press Release No. 99-5 & Northern Daily News, August 10, 1999, http://www.pathcom.com/~goldeye/).

KRL Resources Corp.

KRL Resources Corp. announced drill results on the Copper Hill volcanic-hosted massive sulphide property near Shining Tree. Drill hole CH99-01 intersected 3 sulphide-rich zones. Hole CH99-02 is interpreted to have intersected the third zone of hole CH99-01 and that the first 2 zones were displaced by a mafic dike. The best copper value from CH99-01 is 1.88% over 1.0 m and silver averaged 5.8 ppm over 25.8 m. In hole CH99-02, a sulphide rich zone, between 98.70 and 126.1 m down hole, averaged 5.6 ppm Ag.

In October, KRL began cutting a 62 km grid to cover a belt of known volcanogenic massive sulphide mineralization and its contact zone with a large body of Nipissing diabase. Ground magnetic and VLF-electromagnetic surveys were subsequently completed (KRL Resources Corp. Press Releases June 1, 7, 18, 25, October 15, 1999, http://www.krl-res.com).

Link, T.A.

Terry A. Link completed six short diamond drill holes on his Catharine Township property. Five of the holes intersected gold mineralized zones. The best intersection came from diamond drill hole Cat-99-4, grading 2.77 g/t Au over 106 feet from 103 to 209 feet. A previous best intersection by Sudbury Contact was 7.1 g/t over 4 m in diamond dill hole FM-93-5 (T.A. Link, personal communication, 1999). For further information, please see the property visit reports.

Marl Resources Corp.– McCool Township

Pelangio-Larder Mines, Limited announced that Marl Resources Corp. can earn a 50% interest in the McCool Syncline property by paying Pelangio $30 000 and funding the first phase of diamond drilling. The property is approximately 8 km southeast of the Potter Mine (Marl Resources Press Release April 19,1999). Marl Resources completed two drill holes that tested two adjoining electromagnetic anomalies. The holes did not intersect significant mineralization, however, the presence of a hyaloclastite horizon was confirmed. This is considered significant, since Millstream Mines is exploring such a horizon for base metals on the nearby Potter Mine property (The Northern Miner, August 23-29, 1999, p.2).

Millstream Mines Ltd.

Millstream Mines Ltd. continued exploration of the Potter Mine property in Munro Township. Early in the year, Deeper Drill Hole S99-01A was targeted to test the downward continuity of the Cu-Zn-Co sulphide mineralized mine horizon, 1000 feet below the previous intersected sulphide zone in hole S98-01. The intersected zone is located at a

vertical depth 605 m (1986 ft.) from surface. Drill hole S99-01A intersected 4 massive sulphide intervals over a core length of 203 feet. Assay results for the intersections are:

Intercept Interval Metres	Core Length Metres	Feet	Cu Percent	Zn Percent	Co Percent	Ag oz/t
1171.9 - 1179.7	7.82	25.66	1.96	3.18	0.085	0.53
1165.2 - 1166.2	1.00	3.28	1.26	1.18	0.036	0.29
1161.0 - 1162.0	1.00	3.28	1.71	0.46	0.037	0.34
1158.4 - 1159.9	1.55	5.09	2.11	1.40	0.093	0.50

The Hunter Dickinson Group Inc. (HDG) entered into a limited partnership with Millstream in 1999, whereby HDG would provide up to $19 million for exploration. Phase 1 of the limited partnership would provide a maximum of $4 million to earn a 30% interest in the property for HDG. The company was unable to raise the necessary funds and the agreement is in limbo.

Section IP and down-hole geophysics identified a favourable target 400 to 800 m east of the old shaft, dubbed the East Blue Sky Zone. This has a similar signature to the ore body, previously mined, and mineralization intersected in drilling beneath the old workings to a depth of 3000 feet. A volcanic vent zone was discovered between the target and the old workings.

The Blue Sky Zone was tested with 2 drill holes (S99-06 and S99-07) and the deepening of an older hole (S97-07). Hole S99-06 was abandoned, due to ground conditions, before reaching its targeted depth. Weak sulphide (pyrrhotite + chalcopyrite + sphalerite) disseminated and fracture style mineralization was intersected in each hole at various vertical depths establishing a continuous zone. This zone, containing remobilized sulphide mineralization, averages 220 m wide down to 710 vertical meters below surface and remains open at depth.

Millstream Mines Ltd. recently signed a letter Agreement with Teck Corporation, to further advance Millstream's Potter property. The agreement grants Teck Corporation a first-right of refusal to purchase, in whole or in part, the Potter property, and is subject to Teck satisfying itself of all underlying agreements pertaining to the Potter property. Teck Corporation will supply field assistance, reviews, recommendations, guidance and written comments on technical reports, if appropriate, at no charge to Millstream. Additionally, if requested, Teck shall provide Millstream with verbal advice and comment in sourcing and securing funding to continue active exploration programs towards developing and expanding the potential of the Potter property. Millstream accordingly, has notified and discussed the above matter with the Hunter Dickinson Group of Vancouver (www.millstreammines.com , Millstream Mines Ltd. Press Releases March 25, April 15, May 13, July 7, September 28, November 10, December 21, 1999, Northern Daily News April 1, p. 1, November 12, p. 3, 1999, The Northern Miner November 15-21, 1999, p. 12).

NFX Gold Inc. and Fort Knox Resources Inc.

NFX Gold Inc. and Fort Knox Gold Resources Inc. announced the results of the Phase 1 deep diamond drilling program on the Larder Lake properties located 35 km east of Kirkland Lake, Ontario. Eleven surface diamond drill holes were completed, four holes were abandoned due to drilling technicalities, and one old drill hole was deepened. In total, 12,596.7 m of diamond drilling was completed. The objective of the drill program was to test the strike extensions of known "Kerr Addison type" gold mineralization on the Option/Joint Venture's contiguous Fernland, Cheminis and Bear Lake properties. A single hole was drilled on the contiguous Barber Larder property to the east. The program involved targeting the favourable carbonaceous hyaloclastite horizon at 200-m intervals along strike, at a depth of 700 to 800 m below surface.

The diamond drill program demonstrated that gold enrichment occurs in two distinct corridors of intense deformation and metasomatic alteration - the North Gold Corridor ("NGC") and the South Gold Corridor ("SGC") - both of which are evident for at least 2.1 km along trend on the Fernland, Cheminis and Bear Lake properties. Drill holes FL 98-4 and FL 98-5 indicates the existence of a previously unknown deep gold zone on the Fernland portion of the NGC. Indicated strike length of this new zone exceeds the 160 m hole spacing and is open in all directions.

Two holes drilled to depth on the Cheminis property by NFX prior to the formation of the NFX Gold/Fort Knox Gold Option/Joint Venture, were drilled to intersect the "D" Zone deeper than all previous drilling. At a vertical depth of 1120 m, drill hole S98-2 intersected flow-type mineralization which assayed 5.11 ppm Au over 6.75 m true width, including 11.58 ppm Au over 1.71 m ("D" Zone) and 6.45 ppm Au over 0.93 m ("DN" Zone).

The primary objective of a later surface exploration program was to delineate an open pit gold resource within the Cheminis property's North Carbonate Zone. NFX Gold Inc.'s North Carbonate Zone contains sections that are very similar in structure, mineralogy and appearance to the Kerr Addison quartz-carbonate ore. The North Carbonate Zone is almost continuous for a strike length of 2,200 m on NFX Gold Inc.'s Fernland, Cheminis and Bear Lake properties. This zone has seen comparatively little exploration as historically most attention was focused on the sub-parallel "flow-ore" horizons located approximately 150 m to the south.

The exploration program confirmed the presence of a mineralized quartz stockwork zone at surface that to date displays widths of up to 25 m. The North Carbonate Zone is exposed along a strike length of 200 m and remains open in all directions. Visible gold was observed within the quartz stockwork, as well as fine grained pyrite and chalcopyrite. Percussion drilling results, over a 25 square metre test area, yielded an average grade of 3 ppm Au. Drill indicated gold resource estimates at NFX Gold Inc.'s Cheminis gold deposit, including all categories, currently stand at 2.9 million tons grading 0.170 ounces of gold per ton, representing 470,338 ounces of gold. (NFX – Fort Knox Press Release, March 2, 1999, NFX Gold Inc. press release, October 20, 1999)

Northway Explorations Limited

Northway Explorations Limited commenced drilling on its 100% owned Temagami Project optioned from G.H. Belanger and 2973090 Canada Inc. in Briggs Township. Past exploration programs identified anomalous copper mineralization on surface. Recent Horizontal Loop Electromagnetic (HLEM) surveys have delineated a strong EM anomaly coincident with the copper mineralization. The anomaly extends for 500 m in length and contains multiple conductive horizons. Diamond drilling was targeted to test the most conductive intervals of the anomaly. (Northway Press Releases, January 22 and March 16, 1999)

Pentland Firth Ventures Ltd.

Discovered in 1997, Pentland Firth Ventures Ltd. announced further diamond drilling results on the Noel Zone in Michaud Township. This zone has a strike length of 650 m, has been drilled to a depth of 150 m and obliquely intersects the Ludgate Shear Zone. The mineralization is within a strongly hematized syentite porphyry containing up to 5% pyrite. Better intersections include:

PML-21 intersected 1.19 g/t Au over 19.4 m
PML-29 intersected 1.26 g/t Au over 20.5 m
PML-39 intersected 4.19 g/t Au over 12.0 m

The project is a joint venture with QSR Limited (40%) (Pentland Firth Ventures Ltd. Press Release, January 8, 1999, http://www.pfo.com/).

Queenston Mining Inc. – Franco-Nevada Mining Corporation Limited

Queenston Mining Inc. and joint venture partner, Franco-Nevada, completed VLF-EM and geological mapping on the Munro West, Pawnee and Harvey Kirkland properties in Lebel Township. Two linear structures were outlined and interpreted to be the Larder Lake and South Splay deformation zones. Down-hole IP has identified possible flow-ore targets on the McBean and Anoki properties (Northern Daily News, December 7, 1999, p. 3, http://www.queenston.ca/).

Randsburg International Gold Corp.

Randsburg International Gold Corp. recently completed drill hole BH-FL99-01 on its property located in Milner and Van Hise townships. At a depth of 1320 feet, 78 feet of interstitial sulphides (pyrite-chalcopyrite) were intersected. The disseminated sulphides, up to 7%, also include thin, introduced or remobilized vein emplacement. Drill hole FL-99-02 was abandoned short of the target depth. Drill hole FL-99-02B, drilled approximately 220 m northwest of hole FL-99-01, reached a depth of 675 m. Disseminated sulphides, similar to FL-99-01, were encountered. The company reports that drilling indicates the presence of a dunite laccomorphic body at least 2000 feet (610 m) thick. A marginal zone, of at least 80 feet (24.4 m) is composed of peridotite/pyroxenite with 5 to 7% disseminated interstial magmatic sulphides. The marginal zone overlies the basal contact (Randsburg International Gold Inc. Press Release November 30, 1999).

St Andrew Goldfields Ltd. – Carr, Guibord, Hislop and Taylor townships

St Andrew Goldfields Ltd. completed exploration programs in the Carr, Guibord, Hislop and Taylor townships area. In Carr Township a geochemical survey was completed. The company drilled a total of 21 holes totaling 1430 m on the Fenn-Gib property in Guibord Township. In Hislop Township, on properties other than the Hislop Mine property, the company drilled one hole totaling 363 m and completed a geochemical survey. One diamond drill hole totaling 334 m and a geochemical survey was completed on properties in Taylor Township, off the Taylor Mine and West Porphyry Zone properties (K. Jensen, personal communications, January 20, 2000, http://www.standrewgold.com/).

Tres-Or Resources Ltd.

Phase I exploration program included linecutting (15km) HLEM surveys, magnetometer surveys, geological mapping and prospecting on the Shallow River and the Shallow River East properties in Coulson, Knox, Warden and Wilkie townships. In addition, linecutting (5 km), HLEM surveys, magnetometer surveys, mapping and prospecting will be completed over the geobotanical anomaly on the Botany Option in Warden Township. Upon completion of this work the data will be compiled and evaluated (Tres-Or Resources Ltd. Press Release September 27 and November 29, 1999, http://www.tres-or.com/).

PROPERTY EXAMINATIONS

Grenfell Kirkland Property

The Grenfell Kirkland property (MDI42A01NE0002) is located about 2.5 km north of the hamlet of Kenogami and about 450 m east of Hwy 11, along the TransCanada pipeline. The property is accessed via Hwy 11 and a driveable trail along the pipeline. The former Grenfell Kirkland property is part of a larger package of ground held by prospectors D. Robinson and B. McCombe.

Possibly four shafts are located on the property. Two were located during the property visit: UTM zone 17

5331209N 558242E and 5331140N 558350E. According to D. Robinson, another small shaft or pit is located to the south of the two observed shafts and another shaft maybe located west of Hwy 11, based on historical records.

Initial exploration took place, sporadically, between 1915 and 1932. Shafts were sunk, sampled and minor drifting took place. The property was dormant between 1945 and 1981 until the claims came open for back taxes. A.H. Perron completed ground geophysical surveys, overburden stripping and diamond drilling between 1984 and 1988. Hole 88-1 intersected a section that assayed 23.5 ppm Au over 2.5 feet. In 1997, Kinross Gold Corporation held the ground under option and diamond drilled 2 holes totaling 811 feet. One intersection assayed 0.07 ounce Au per ton over 3 feet. In 1999, D. Robinson completed an OPAP grant consisting of linecutting, ground magnetic and geological surveys, and sampling.

The property is underlain by Mg-tholeiitic basalt of the Kinojevis South tectonic assemblage. The regional strike of the rock units is northwest, based on nearby pillowed flows (Grant, 1964). In the area of the northern shaft, a ribboned quartz vein strikes 070° and dips 75° south. A vertical shear zone intersects the shaft at an azimuth of 100°. Adjacent to the vein, the basalt is mineralized with 1-2% disseminated, 1-2 mm euhedral to subhedral pyrite. A sample of rock with quartz veining, from the northern shaft, assayed 17 169 ppb Au and host material assayed 2203 ppb Au. Both samples were collected from the waste dump. Based on an old report, east of the shaft a shear zone displaces the vein system to the north, as confirmed by Kinross' diamond drilling. Drill assays and underground sampling assays are erratic. A 3 ton sample, processed by Temiskaming Testing Lab in 1920, averaged 2.96 ounce Au per ton.

Numerous narrow quartz veins are known to exist in the area that can return mutli-ounce assays. Disseminated pyrite appears to be developed proximal to the auriferous veins. Bedrock mapping of alteration within the host rock and the use of IP to detect disseminated sulphide zones may prove useful in the area. This area will be covered by a new airborne geophysical survey under Operation Treasure Hunt.

Hillcrest Gold Occurrence

R. Lashbrook and J. Morris hold a group of 4 claims (14 units) in Dack and Chamberlain Townships. (NTS:31M/13; UTM: Zone 17 5298797N, 579901E; MDI:31M13SW00002) With the aid of an OPAP grant, a program of power stripping, washing sampling and mapping was carried out during the 1999 field season.

The property is located 30 km southwest of Kirkland Lake. The claim group can be reached by an all-weather gravel road leading north from highway 572. Most of the claim group covers an active farm.

The area is underlain by metavolcanic rocks of the Pacaud Group (2745Ma) and the Wawbewawa Group (2720Ma). The Round Lake batholith lies immediately north of the claim group. In the vicinity of the property, the intrusion is in faulted contact with the metavolcanic rocks.

Locally, the volcanic rocks strike northeast-southwest and are steeply dipping. The northwest portion of the property is underlain by Pacaud Group tuffs and clastic and chemical sediments (iron formation). Schistosity in the rocks intensifies with increased proximity to the contact with the Round Lake Batholith. The remainder of the property is underlain by Wawbewawa Group massive to pillowed, mafic to ultramafic metavolcanic rocks. Spinifex texture has been noted and the flows are weakly to strongly magnetic. Ultramafic units can be altered and contain quartz-carbonate veins with green fuchsite or brown carbonate alteration.

The main point of focus on the property is the Hillcrest vein on claim L1229722. The gold bearing quartz-carbonate vein, as exposed, is within a 25 m wide, brown-carbonate altered deformation zone that trends northeast, sub-parallel to bedding. A 6 by 9-foot shaft was sunk on the vein to a depth of 45 feet prior to 1939. Since that time, numerous claim holders have worked the property completing surface sampling and diamond drilling. The vein can be traced to the southwest where it disappears under a thick cover of clay. Short diamond drill holes failed to intersect the strike extension of the vein under the farmer's field to the west.

The 1999 exploration program consisted of stripping and washing an area about 85 m by 15 m. in the shaft area. On the northeast end of the stripped area, the vein was found to pinch out along the contact between the deformation zone and a mafic intrusion. The vein continues to the southwest, slightly cross-cutting the deformation zone until it disappears under overburden.

The vein is composed of quartz with lesser amounts of carbonate and averages about 1 m in width. Locally the vein contains pyrite, graphite and fuchsite. Some portions of the vein are pale mauve in colour, somewhat resembling amethyst. Twenty-five samples, collected as part of the OPAP project, ranged from a few ppb Au to a maximum of 9463 ppb Au with eight samples returning values greater than 1000 ppb Au. A sample collected during a property visit returned 10 859 ppb Au.

An airborne geophysical surveys conducted as part of Operation Treasure Hunt will cover the area and may help trace the deformation zone to the west through the clay cover.

Link-Catharine Property

T.A. Link holds 8 claims (34 units) in the southwest corner of Catharine Township, covering basal volcanic rocks of the Catharine-Pacaud Assemblage, directly adjacent to the eastern contact of the Round Lake Batholith. A gold showing, located at UTM Zone 17 5310540N 583890E on the property was originally discovered by F. Marshall and subsequently optioned by Sudbury Contact Mines Limited. The company completed several diamond drill holes with the best intersection being 7.1 g/t Au over 4 m in hole FM-93-5.

The claims covering the showing were allowed to lapse and were subsequently staked by T.A. Link. who completed 6 diamond drill holes in 1999 totaling 1617 feet (T.A. Link, personal communication, 1999). Three holes intersected significant gold mineralization with the best intersection in diamond drill hole CAT-99-4, which assayed as follows:

2742 ppb Au over 106.3 feet from 102.7' to 209' including
5624 ppb Au over 28.3 feet from 102.7' to 131'
1832 ppb Au over 45.5 feet from 142' to187.5'
3202 ppb Au over 14.7 feet from 194.3 to 209'.

Gold is associated with pyrite- and sheared quartz-bearing "green carbonate" alteration at 3 separate sites, which occur close together and do not align with each other. The geology in the showing area is complicated, and it is not known if the "green carbonate" alteration sites are part of a single displaced hydrothermally altered shear zone or multiple sub-parallel hydrothermally altered shear zones. The "green carbonate" zone (or zones) is apparently associated with an east-trending structure(s), which intersects north trending volcanic rocks. The volcanic rocks, consisting of interlayers of mafic and ultramafic rocks, top to the east and apparently dip to the east. "Green carbonate" is formed by the hydrothermal alteration of permeable ultramafic rocks. Faulting and associated brittle deformation along fault planes was, perhaps, the most common cause for the creation of permeability in Archean rocks predating the formation of gold deposits. In the case of the showing area, the more or less perpendicular intersection, at surface, of ultramafic volcanic layers with the hydrothermally altered auriferous structure(s) suggests that "green carbonate" would only have developed where the two intersect. Since gold, so far, appears to be associated only with "green carbonate", the down plunge direction of the two intersecting planes of ultramafic volcanic rocks with the auriferous structure(s) should be the focus for testing the potential depth extension to gold mineralization. Unfortunately, on a showing scale the geology is very complicated and the dip of the volcanic rocks and the dip and strike of the plane of the auriferous deformation zone are not constrained.

Martin Bird Property

The Martin Bird property (MDI32D04SE00143), in Hearst Township, UTM zone 17 5322800N 599473E is located approximately 6 km south of the hamlet of Larder Lake along Hwy 624 and 3 km east along a gravel access road.

The original property was composed of 32 claims. The Martin-Bird Syndicate trenched the property in 1933 and began shaft sinking in 1934. Martin-Bird Gold Mines, Limited, was organized in 1936 to develop the property. Exploration and development continued until 1939, by which time, two 400-foot deep shafts were developed with levels at 125, 250 and 375 feet, and a total of 10 301 feet of drifting, 5179 feet of crosscutting and 319 feet of raising were completed (Thomson, 1947). The company held the property until the 1970's when it was acquired by R.A. MacGregor. A number of exploration programs have taken place since that time, including geological and ground geophysical surveys, overburden stripping, rock and humus sampling and diamond drilling.

A number of resource calculations have been completed for the property including: 158 800 tons at 0.21 ounce Au per ton (1938), 181 100 tons grading 0.15 ounce Au per ton (1945), 1.9 million tons at 0.09 ounce Au per ton to a depth of 350 feet (1975), open pitable resource of 1.3 million tons of 0.09 ounce Au per ton to a depth of 250 feet (1975), later revised to 0.05 ounce Au per ton (1975) and 558 000 tons grading 0.114 ounce Au per ton over an average width of 8.2 m in 3 zones (1980).

The property is underlain by clastic sedimentary wacke and argillite of the Timiskaming Group intruded by feldspar porphyry dikes and lies within a major northwest-trending syncline that has been overprinted with a series of northeast-trending crossfolds. The rocks are similar to the Timiskaming sedimentary rocks along the Cadillac-Larder Fault Zone (CLFZ) but lack jasper and trachytic voclanic rock fragments. The vein zones of the deposits lie within a strong shear zone that trends 060°. The shear zone may be related to a southwest-trending splay off the CLFZ to the southeast of the vein zone. In the vicinity of the deposit, the foliation changes to a northeast strike direction (Tims, 1995).

Exploration has identified 3 auriferous zones over a strike length of 900 m. The surface exposure of the No. 1 zone near the No. 1 shaft reveals 2 discontinuous quartz-carbonate veins, approximately 1 m wide each, separated by about 4 m. Contorted, fine grained sedimentary rocks are cut by lamprophyre and boudinaged syenite dikes. The veins are surrounded by a carbonate-pyrite alteration zone. A sample of the zone exposed, near the No. 1 shaft at surface assayed 3637 ppb Au (5322707N 599389E). A sample of quartz-veined muck from the No. 2 shaft assayed 2203 ppb Au (5322762N 599253E). A quartz vein, located along the road into the property, along strike of the zone to the southwest assayed 3703 ppb Au (approximately 5322650N 599100E). To the northeast, stripping on the shear zone by Lac Minerals returned disappointing results. It was concluded that the Martin-Bird zone may be faulted off and transposed either north or south. A program of systematic stripping with detailed structural and lithological analyses may lead to the location of the zone toward the northeast. As part of Operation Treasure Hunt, an airborne geophysical survey will be flown over the property, which may assist in locating the northeast continuation of the Martin Bird zone.

O'Connor, Diadem and Jessie Lake Cu, Ni, Au Occurrences

D. Laronde, Teck Corp., G. Chitaroni, L. Goddard and D. Jones hold groups of claims along the south shore of the Northeast Arm of Lake Temagami in Strathcona Township. The properties are located 3 km southwest of the town of Temagami and can be reached by old exploration/logging roads leading south and west from the Temagami Marine road (Strathcona road).

The properties lie within the Temagami greenstone belt. The main rock types are intermediate to felsic metavolcanic flows and pyroclastic rocks. The Temagami Island gabbro (TIG), a conformable sill-like intrusion, exhibiting anorthositic affinity, cuts the metavolcanics. The Iceland Lake pluton lies immediately to the south.

The Northeast Arm Deformation Zone (NADZ) crosses the properties. This shear zone extends along the northeast arm of Temagami Lake, from the Temagami Copper (Copperfields) mine to east of Highway 11, and may have provided a conduit for the TIG. Alteration associated with the NADZ consists of silicification, carbonatization and pyritization. Numerous Cu-Ni occurrences are found within the NADZ, notably on the south contact of the TIG with felsic metavolcanic rocks.

D. Laronde's claims include the O'Connor copper-nickel-gold occurrence (MDI31M04SW00072). A geophysical

survey and sampling were carried out on this property in 1999, with the aid of an OPAP grant. Teck Corp. holds 5 leased claims east of the O'Connor occurrence, which host the Diadem Cu-Ni deposit (MDI31M04SW00077) with reported reserves of 450 000 tons grading 0.5% Cu, 0.1% Ni to a depth of 400'. Staked claims further to east are part of the Jessie Lake property held by G. Chitaroni, L. Goddard and D. Jones. The Jessie Lake property was under option to Redstar Resources Corp. in 1998 who carried out a program of prospecting, sampling and mapping.

Recent sampling on the properties returned significant copper, nickel, gold and PGE values. This mineralization within the NADZ continues through the properties for a strike length of at least 3 km. A real section IP survey may be helpful in determining the width of the mineralized area. As well, airborne geophysical surveys acquired for Operation Treasure Hunt will cover the area and may help in tracing the deformation zone.

Roosevelt Road Quarry

Blackstone Development Inc., on behalf of Temagami Traprock Ltd., identified a bedrock source of traprock, for aggregate production, 15 km north of Temagami in Best Township.

The mineral claims covering the traprock deposit lie 13 km north of Temagami and about 2 km east of Highway 11along the Roosevelt Road. The Central Zone of the Roosevelt Road quarry is located at UTM 17 5223874N 597859E. The main Ontario Northland Railway (ONR) railine is 2 km west of the deposit and a spurline is located 14 km south of the property near the former Sherman Iron Mine in Strathy Township.

The Temagami Traprock property consists of 7 claims (52 units) covering a total of 832 ha. A quarry permit was issued on March 12, 1999 for 15 ha within the Temagami traprock claim group. Mr. G. Chitaroni is in the process of bringing two mining claims; claims S 1118527 & S 1212011, each comprised of three units, to Mining Lease status. G. Chitaroni holds the mineral claims on the Temagami traprock property in trust and G. Chitaroni and A. Beecham share royalty on the claims. Blackstone Development Inc., a Cobalt based company, owns 100% of Temagami Traprock Ltd.

The traprock deposit is made up of fine to medium grained gabbroic rocks, which form part of a "Nipissing Diabase" sill. In the quarry area, gabbroic rocks become more felsic from east to west, ranging in silica content from 46% to 51% and in iron content from 20% to 12%, respectively. The deposit comprises an approximate volume of 2.25 miles long by 1 mile wide and 500 to 600 feet thick. Quarry sites are in the lower middle portion of the sill. Preliminary investigations suggest that there is a resource of 238-260 million tons of material above the Roosevelt Road level. The quarry site is covered by 1 to 2 m of overburden.

Traprock aggregate is used for asphalt, high-strength concrete, railway ballast, riprap, shoreline breakwater fill, road/highway fill, roofing granules and rock wool insulation.

To date, Blackstone Development Inc. has spent approximately $225 000 on behalf of Temagami Traprock Ltd. Studies and projects completed include the following: market research (1996), operational cruise "timber assessment" (1997), stage one "archaeological and heritage impact assessment" (1997), blast impact analysis (1998), aquatic resources baseline study (1998), public consultations (1998), quarry site plan/maps, tests, assays & sampling chart and prospecting and sampling plan.

Trow Consultant Engineers Ltd. completed a 300 lb. composite sample for aggregate for concrete and asphalt use, high temperature, melting temperature, abrasion, skid resistance and rail ballast.

Anticipated annual production will gradually rise from initial 50 000 tons per annum to an optimum 500 000 tons per annum in five years, depending on market demand.

The project is projected to create between 8 and 10 seasonal jobs (Chitaroni 1998 and property visit given by G. Chitaroni and attended by G.P.B. Grabowski and G. Meyer on August 20, 1999).

RECOMMENDATIONS FOR EXPLORATION

Allsopp- Huston Gold Property

The Allsopp-Huston property, consisting of 12 leased mining claims, is located 10 km southwest of Kirkland Lake in Eby and Otto townships. The property has a long history of exploration, dating back to the 1930's, and includes detailed geological mapping, trenching, magnetometer, and IP surveys, diamond drilling and development of a 32 m deep shaft.

A major altered deformation zone, consisting of iron carbonate, silicification and pyritization, occurs over a strike length of 1000 m and a width of 200 m on the property along the Eby-Otto fault. This fault is a subsidiary of the Larder Lake Break within Archean tholeiitic metavolcanic rocks. A silicified breccia zone with disseminated pyrite is hosted within the altered deformation zone. The breccia zone has a strike length of 600 m and a width of 50 m. Geochemically anomalous gold values, ranging up to 1851 ppb Au, occur in the breccia zone and the alteration zone. Moderate to strong IP (chargeability) anomalies occur within the alteration zone over a strike length of 800 m and a width of 100 m.

The IP anomalies in the alteration zone along the Eby-Otto fault, 1.5 km south of the Larder Break, are attractive targets for further exploration. The past-producing Swastika Mine, on the Larder Lake Break, is located 4 km northeast of the property. The recently discovered Amalgamated Kirkland deposit, located along a subsidiary fault north of the Larder Lake Fault Zone, is 9 km to the northeast.

The nature of several gold deposits in the Kirkland Lake – Larder Lake gold belt is such that they occur at depth within carbonate-altered rocks exhibiting geochemically anomalous gold concentrations at surface. The alteration and anomalous gold values tend to envelop potentially economic gold mineralized zones and continue to surface above "blind", deep-seated gold deposits. The Amalgamated Kirkland deposit is an example and occurs at a depth of 250 m with alteration and anomalous gold values continuing to surface. In view of the experience at the Amalgamated Kirkland, a program of deep IP is warranted to explore at depth the geochemically anomalous gold values associated with extensive Fe-carbonate alteration and silicification at surface.

A two-phase program is recommended. The first phase should consist of line cutting, magnetometer, fill-in and deep IP surveys, trenching, stripping, geological mapping and sampling. The second phase should diamond drill test deep IP anomalies at depth. (Proposal - courtesy Sharpley 1999, Meyer et. al. 1991 and Kirkland Lake Assessment File No. KL 4110).

Copper-Nickel-PGE Mineralization

Recent successes in the exploration for PGE mineralization in the Sudbury area (i.e. East Bull Lake, River Valley) warrant another look at the potential for similar deposits in the Temagami area. Following is the Recommendations for Exploration from the 1994 Report of Activities (Ireland, 1995). References cited can be referred to in that publication.

> Numerous Copper-Nickel-PGE occurrences, showings and deposits are documented in the Temagami area of northeastern Ontario. Most are associated with Archean extrusive and intrusive rocks (i.e. the Copperfields mine, Phyllis Township; the Kanichee deposit, Strathy Township). To a lesser extent copper-nickel occurrences appear to be associated with Proterozoic intrusive rocks, notably Nipissing diabase dikes and sills (i.e. Cooper Lake occurrence, Eldridrige Township).
>
> Documentation of copper-nickel mineralization in Proterozoic mafic intrusives is minimal (R. Thompson, 1968; E.W. Todd, 1925, 1926; Assessment Files Cobalt; R. Thompson notes, Cobalt). Much of the available information is based upon work done prior to 1970, and some observations were made only in connection with silver exploration activities carried out is the early 1900's. Some of the more accessible showings along the

Highway 11 corridor, in Best and Gillies Limit townships, were under evaluation when the Temagami Land Caution was initiated in 1973. Little additional work was done prior to reopening of the peripheral lands in 1991 and the lifting of the Caution from Strathy, Cassels and Best townships in 1992. Copper-nickel mineralization is well documented within the Archean rocks of the Temagami greenstone belt (O. Bennett 1978; W.W. Moorhouse; 1942; R. Thompson, 1968; P.S. Simony, 1964).

At the Copperfields mine, copper-nickel mineralization is associated with semi-massive to disseminated pyrite at the lower contact between an altered felsic gabbro and rhyolite volcanic rocks. The gabbro is steeply dipping, approximately 250 m thick and has a strike extent of at least 5 km. The intensity of mineralization varies greatly but is present over most of the defined strike length of the gabbro. Copper is associated with chalcopyrite. Nickel is associated with millerite, gersdorffite, linnaeite and cobalt-nickel sulpharsenides.

At the Kanichee mine, copper-nickel mineralization occurs within a northwest trending extension of a larger gabbroic Intrusion. The extension is about 240 m long by 90 m wide and plunges 23° to the southeast. The extension is altered to serpentine and amphibole, while the main gabbroic intrusion is relatively unaltered. Pyrite, pyrrhotite and chalcopyrite are the primary minerals present, occurring as semi-massive to massive veins within the extension zone. Significant gold, silver and platinum-palladium occur with the sulphides.

Several copper-nickel sulphide occurrences are documented in the vicinity of Granite Lake in Best Township and west of Rib Lake in Gillies Limit Township. The majority of these occurrences are hosted in mafic to ultramafic intrusive rocks or their extrusive equivalents. One showing, located south of Granite Lake in Best Township, occurs in a hybrid mafic dike intruding granite. Significant platinum and palladium is associated with copper-nickel sulphides concentrated along the east contact of the dike. Approximately 500 m south of the copper-nickel-PGE showing the dike is feldspathic, suggesting a possible anorthositic phase (see Chitaroni (Acana No. 5) showing under "Property Descriptions").

West of Cooper Lake in Eldridge Township, copper-nickel mineralization occurs within a quartz diorite intrusion of possible Proterozoic age. Semi-massive chalcopyrite, pyrite and pyrrhotite occur within a brecciated, feldspathic phase of the quartz diorite across widths that vary from a few centimeters to over 3 meters (see Goddard (Cooper Lake) showing under "Property Descriptions").

The presence of numerous and widely distributed metalliferous mafic and ultramafic intrusives, and their extrusive equivalents, within and adjacent to the Temagami greenstone belt, is significant. Prospecting for copper-nickel mineralization should be directed to known areas of mafic, ultramafic or anorthositic intrusion. Prospective areas include areas adjacent to Archean basement-Proterozoic sediment contacts (i.e. west of Rib Lake, east of Mountain Lake, northeast of Rabbit Lake, north of Cassels Lake) and generally, along the Highway 11 corridor north of Strathcona Township to Cobalt.

Additional prospective areas not currently open to staking or prospecting are located in northern Chambers Township, along the Northeast Arm of Lake Temagami, central Banting Township, most of Strathcona Township, and the east part of Cynthia and Joan townships.

Since 1994, many areas referred to above have been reopened to staking and exploration. Significant results from recent exploration programs include 1500 ppb Au, 1900 ppb Pt and 1390 ppb Pd from samples on the Granite Lake property in Best Township (held by G. Chitaroni). Anomalous PGE values have been obtained from properties on the Northeast Arm Deformation Zone in Strathcona Township (Diadem and O'Connor).

Epidote Alteration with possible VMS Association in Maisonville Township

Several years ago Mr. M. Dyment brought the occurrence of extensive epidote and garnet alteration of mafic metavolcanic rocks in Maisonville Township to the attention of the Kirkland Lake Regional Resident Geologist.

This occurrence is along a section of the TransCanada pipelines east of Highway 11 from approximately UTM 17 5341270N 555670E to 17 5342580N 555730E. Subsequently, F. Santaguida (1999) concluded that epidote-quartz patches, apparently associated with VMS deposits in the Noranda area, are produced by synvolcanic fluid-rock interactions and are not generated by post-volcanic regional metamorphism. This observation has prompted further investigation of the site.

Extensive epidote and garnet alteration occurs in outcrop and broken rock exposed by blasting operations along the gas pipelines. Epidote occurs both in mafic metavolcanic rock and felsic syenite intrusion. In the syenite, epidote is confined to joint planes and is up to several mm thick. The mafic metavolcanic rocks consist of pillow lava and massive flows with epidote alteration along pillow margins and fractures. The width of epidote alteration ranges from minute fractures up to several cm wide. The best epidote-garnet development is along pillow margins, especially at the junction of more than two pillows. The widest epidote zones usually have well-developed garnet cores.

Two samples of blasted rock were analyzed. One sample is epidote-garnet hydrothermally altered metavolcanic rock and the other is mafic metavolcanic rock. The former rock type represents the altered equivalent of the latter. A comparison of the assay results suggests the following: substantial depletion in SiO_2, MgO, Na_2O, K_2O, Co Cu, Rb, Sr and Cs; moderate depletion in Ni and Zn; and enrichment in CaO, S and Sr (See Table 10). Although Zn is only moderately depleted, the overall identified element depletions are consistent with chemical changes one might expect in hydrothermally altered sub-volcanic source rocks at the time of VMS formation at the sea floor. If this interpretation is correct, then geophysical EM anomalies higher in the stratigraphy to the epidote-garnet altered rocks, i.e., to the NE, should be given special consideration for their base metal potential.

Potential "New Gold Camp" in Lake Abitibi Area

A number of auriferous quartz boulder occurrences along the shore of Lake Abitibi, the well documented Milligan gold–bearing quartz boulders and esker sand and gravel with high gold grain content in the NW part of Lake Abitibi indicate the potential for gold deposits in the up glacial direction(s). Auriferous sand and gravel occur in the vicinity of the common four corners of Milligan, Warden, Kerrs and Chesney Bay townships (Kirkland Lake Assessment File KL 0199) and the western shore of Long Point in Lake Abitibi. The present known minimum east – west distribution of auriferous glacial material is 30 km. The dispersal is far too large to suggest a single source for the gold, suggesting multiple sources, in the up-glacial direction(s). Multiple sources suggest the potential for a new, yet to be discovered, gold camp.

The source of the gold is in the up glacial direction to the north and is most likely associated with an east – west trending suite of rocks comprised of clastic metasedimentary rocks, chemical metasedimentary rocks, mafic intermediate metavolcanic rocks/intrusions and ultramafic intrusive and extrusive rocks. Two sub-parallel sedimentary belts are separated from each other and are each bounded at the southern contact by major deformation zones (Ayer, J. A., et. al. 1999). The sedimentary belts stretch, on the Ontario side, from Hepburn Township at the Quebec border, for more than 100 km to the west. A section of these belts occur north of Lake Abitibi and are partly covered by the Northeast Bay. Adjacent to, and underlying the Northwest Bay of Lake Abitibi, the favourable stratigraphy exhibits a flexture similar to the flexture on the Larder Lake Fault Zone in the Kirkland Lake – Virginiatown gold camp that hosts significant gold deposits.

The most likely source areas for the glacially dispersed gold is extensively overburden and partly lake covered. These factors, as well as limited access in some areas, are the main deterrents to conventional outcrop prospecting. New exploration tools, meaningful in this difficult to explore terrain, are required. Technologies such as reverse circulation drilling, sonic drilling, IP surveys, walking magnetometer surveys, VLF-EM surveys, vegetation and soil/overburden sampling, enzyme leach testing need to be applied.

The following is proposed for follow-up exploration:

1. Compile literature and Assessment File data on auriferous quartz boulders and gold-bearing glacial material in

the Lake Abitibi area

2. Summer (best when lake at low level) – by boat
   a) search and document occurrences of quartz boulders and sulphide-bearing boulders along the shore of the NW part of Lake Abitibi and analyze them for gold
   b) pan gravel/sand for gold and other heavy mineral concentrates all along the shore of the NW part of Lake Abitibi - the best starting point is perhaps along the western shore of Long Point (for location see Timmins – Kirkland Lake Geological Compilation Sheet, Map 2205)
3. Winter – Based on Summer results, lay out reverse circulation and/or sonic drill program – this program would be designed to follow up on gold dispersion fans in the up glacial direction to determine the approximate source area(s)

OGS ACTIVITIES AND RESEARCH BY OTHERS

Ontario Geological Survey Activities

J.A. Ayer and N.F. Trowell continued with the multi-year project to produce a series of geological compilation maps of the Abitibi greenstone belt (AGB). In conjunction with S. Kamo, Y.Y. Kwok and Y. Amelin of the Jack Satterly Geochronology Laboratory, Royal Ontario Museum, a number of samples were submitted for U-Pb analysis in order to aid in the revision of the AGB stratigraphy

B.R. Berger continued a multi-year project to improve the geological database along the Highway 101 corridor. The emphasis in 1999 was on the Hislop township area.

G.W. Johns continued a project to reappraise the geology of the Shining Tree area. This summers' work concentrated on the western 6 townships of the area (Cabot, Kelvin, Connaught, Churchill, Miramichi and Asquith).

C. Vaillancourt mapped the area west of Watabeag Lake including McEvay and Nordica townships (as well as Timmins and Michie Townships in the Timmins Resident Geologist District).

Geological Survey of Canada

C.T. Barrie continued the Kidd-Munro extension project in the Munro North area, which included the townships of Marathon, Boyer, Purvis, Moody, Galna, Knox, Kerrs, Coulson, Warden and Milligan at the western end of Lake Abitibi.

M.B. McClenaghan and B. Kjarsgaard continued investigations into geochemical exploration techniques that can be applied to kimberlite pipes with work on the McLean Kimberlite pipe in Bucke Township, west of New Liskeard. Work, using a backhoe included stripping on the pipe and sampling till "down ice".

University of Ottawa

B. Luinstra and K. Benn continued a structural investigation of the Holloway Township Gold Camp. The focus of the 1999 field season included surface and underground mapping at the Holt-McDermott Mine and logging diamond drill core in order to identify and define major structures within the mine and their controls on mineralization.

L.Pigeon and A.E. Lalonde, along with B. Berger (OGS), began a study of syenitic intrusive rocks that occur near the Destor Porcupine fault zone (DPFZ) in Guibord, Michaud, Garrison and Harker townships to explore the potential genetic relationship between these intrusions and gold mineralization. Five intrusions were sampled in the 1999 field season, the Iris syenite, Garrison stock, Emens Lake intrusion, Ludgate syenite and the Pangea intrusion.

University of Portsmouth, UK

H.S. Oliver,D.J. Hughes and R.P. Hall in conjunction with G.W. Johns' reappraisal of the Shining Tree area, undertook geochemical sampling of metavolcanic rocks. The work is designed to determine the lithostratigraphic development, tectonic evolution and tectonomagmatic provenance of the Shining Tree greenstone belt and to facilitate the understanding of the effect of these processes on mineral deposits.

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Thomson, J.E. 1947. Geology of Hearst and McFadden townships; Ontario Department of Mines, Annual Report v.56, pt.8, 34p., accompanied by map 1947-1, scale 1:12 000.

Tims, A.A.B. 1995. Thunderwood property, overburden stripping program Hearst Township, Larder Lake Mining District, Kirkland Lake Resident Geologist Office Assessment File KL-3752, 10p.

Table 1. Summary of claims recorded and assessment work credits filed in the Larder Lake Mining Division - 1999.

Year	Claims Units Recorded	Claim Units Cancelled	Claims Units Active	Diamond Drilling ($)	Physical Work ($)	Geotechnical Work ($)	Total ($)
1999	4 042	11 603	27 767	N/A	N/A	N/A	11 119 663*
1998	N/A	N/A	35 328	N/A	N/A	N/A	15 152 730*
1997	9599	6858	37 083	N/A	N/A	N/A	N/A
1996	11007	6976	34 342	6 301 498	482 193	2 104 082	8 946 773
1995	8399	6153	31 492	3 347 947	477 415	2 230 599	6 078 375

* *Processed in the calendar year for the Kirkland Lake Regional Resident Geologist's District*

Table 2. Mine production and reserves in the Kirkland Lake Regional Resident Geologist's District - 1999.

Mine	Production to end of 1999		Production in 1999		Reserves at end of 1999	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Extender Minerals	N/A	N/A	N/A	15 000 tons barite	1 year	N/A
Glimmer Mine	840 606 tons @ 0.180 ounce/ton Au	151 203 ounce Au	285 167 tons @ 0.163 ounce/ton Au	46 550 ounce Au	2 212 239 t	6.83 g/t Au
Hedman Mine	N/A	N/A	N/A	1450 t hedmanite	9 000 000 t	N/A
Hislop Mine	255 150 tons @ 0.137 ounce/ton Au	35 052 ounce Au	50 025 tons @ 0.076 ounce/ton Au	3782 ounce Au	161 500 t	4.04 g/t Au
Holloway Mine	1 784 495 tons @ 0.178 ounce/ton Au	317 492 ounce Au	537 175 tons @ 0.201 ounce/ton Au	107 780 ounce Au	4.076 million t	6.5 g/t Au
Holt-McDermott Mine	5 725 461 tons @ 0.161 ounce/ton Au	920 382 ounce Au	554 530 tons @ 0.195 ounce/ton Au	108 081 ounce Au	3 022 00 tons	0.202 ounce/ton Au
Lake Shore Crown Pillar Project	73 470 tons @ 0.402 ounce/ton Au	29 545 ounce Au	18 650 tons @ 0.193 ounce/ton Au	3593 ounce Au	none	none
Lake Shore Tailings Project	3 117 181 tons @ 0.053 ounce/ton Au	163 761 ounce Au	215 344 tons @ 0.054	11588 ounce Au	none	none
Macassa Mine	7 877 532 tons @ 0.448 ounce/ton Au	3 525 389 ounce Au	57 891 tons @ 0.388 ounce/ton Au	22 384 ounce Au	N/A	N/A

[1] *Bulk sample production*

Table 3. Assessment files received in the Kirkland Lake Regional Resident Geologist's District in 1999.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARa ..... Airborne radiometric survey
AVLF-EM ..... Airborne Very Low Frequency EM survey
Beep ..... Beep mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
EBS ..... Environmental Baseline Study
Gc ..... Geochemical survey
GL ..... Geological survey
Ind ..... Industrial Mineral Study
M ..... Ground magnetic survey
Gv ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
IP ..... Induced polarization survey
Lc ..... Linecutting
OvD ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
PW ..... Physical work
RE ..... Re-evaluation of surveys
R ..... Resistivity survey
rTr ..... Trenching
SA ..... Sampling (other than bulk)
sTr ..... Stripping
VLEM ..... Vertical loop electromagnetic survey
VLF-EM ..... Very low frequency electromagnetic survey
Ug ..... Underground work

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Abbotsford, Adair	Fekete, M., Ferderber, R. "Plusplus Project"	1997-1998	Lc, Pr, GL, M, VLF-EM, SA, Beep	2.19625	KL-4574, KL-4635
Alma	Cunningham L. " Cunningham Property "	1997-1998	Lc, Pr, sTr, M, GL	2.19292	KL-4573, KL-4617
Alma, Baden, Robertson, Sheba	Dunn, G.C.	1998	Lc, Pr, Gc, SA	2.19055	KL-4496
Alma, Flavelle, Holmes	Bice Ventures Corp. "Chartre - Dufresne Property"	1998	Lc, IP	2.18724	KL-4473
Alma, Sheba	Dunn, C. Gary "Squaw Lake Property"	1998-1999 (1)	Lc, M, VLF-EM	2.19261	KL-4566
Amyot, Browning, Ogilvie, Sheard	Falconbridge Ltd. "Tindale-Annett Option Property"	1995-1996	HLEM, DPEM, TEM	2.19647	CO-2460
Arnold	Merrick, A. "Victoria Lake Property"	1998	DD(4)(960')	2.19066	KL-4500
Askin, Eldridge, Herbert, South Lorrain	Goddard D. L.	1997	sTr, rTr, Pr, SA	OP97-003	CO-2461
Asquith	Annett, R. "Gibson Break"	1998	sTr, SA, DD (1) (350')	2.19421	CO-2462
Asquith	Salo, L. "Buckingham Property"	1998	Lc, VLF-EM, M, Pr, sTr	2.19414	CO-2463
Asquith, Churchill	Skead Holdings Ltd. "Beilby Lake Property"	1997-1999 (2)	Lc, VLF-EM, GL, M, SA	2.19163, 2.19530	CO-2464, CO-2465
Baden	Maude Lake Explorations Ltd. "Baden Property, King Showing"	1999 (3)	DD(4)(340') Pr, SA, GL, rTr, sTr	2.19803, 2.19270	KL-4672, KL-4534
Baden, Powell	Boyce, E., Banister, C. "Boyce & Banister Property"	1998	Lc, Pr, SA, VLF-EM, sTr, rTr, DD(1)(115')	2.19456	KL-4627
Bannockburn, Montrose	Outokumpu Mines Ltd. "Bannockburn Twp. Property"	1996-1999 (4)	DD(18)(6220.5m), SA	2.19422, 2.19053	KL-4591, KL-4494
Banting	MacDonnell A.	1997	Pr, Lc, M, VLF-EM, sTr, rTr	OP97-294	CO-2466
Banting	MacDonnell, A. Claim 1214660	1998	Lc, sTr, rTr, M, VLF-EM	2.19487	CO-2467
Banting, Best, Brigstocke, Chambers	Temex Resources Ltd. "Snare Lake Claim Group"	1998-1999 (5)	Pr, Gc, SA	2.19640	CO-2468
Barnet	Boulder Mining Corp. "Barnet Lake Project"	1998	Pr, GL, SA	2.19520	KL-4607
Barr, Firstbrook	Silver Century Explorations Ltd. "Firstbrook Property"	1997	DD (1) (1602m)	2.19192	CO-2469

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Barr, Klock	Universal Exploration Corp. "Mattawapika Property"	1998	Pr, SA, GL	2.18954	CO-2470
Beatty	2973090 Canada Ltd. "Highway Property"	1997	DD(7)(872m)	2.19322	KL-4595
Beatty, Garrison, Guibord, Michaud	Totem Mining Corp. "Tax, Irish, Munro Fault Zone, Clodan Pros."	1997	DD(9)(1046m)	2.19048	KL-4558
Ben Nevis	Noranda Mining and Exploration Inc. "L' Option Canagau"	1998	DD(2)(2164m)	2,19082	KL-4505
Benoit	Rodholm, C. "Hope & Faith"	1998	Pr, sTr, SA	2.19258	KL-4582
Berhardt	Robinson, D. "Douglas Robinson - Barry McCombe Propert "	1998-1999 (6)	Lc, GL, Pr, HLEM, M	2.19175, 2.19274, 2.19323	KL-4557, KL-4615, KL-4616
Bernhardt	O'Connor, F.T. "Goodfish Lake Property"	1997	DD(1)(527')	2.19065	KL-4501
Bernhardt, Teck	Marion,J. E. "Lakeview Property"	1999 (7)	Lc, VLF-EM	2.19434	KL-4571
Berry, Sulphur Island	1083291 Ontario Ltd. "M. Bissonnette Property"	1997-1998	DD(3)(461m), SA, GL, HLEM, M, Lc	2.19104, 2.19166	KL-4514, KL-4518
Best	Blake, F. "Snare Creek Property"	1998	Pr, SA, HLEM, VLF-EM	2.19059	CO-2471
Best	Chitaroni, G. "Temagami Traprock Property"	1996-1998	Pr, SA, Ind	2.19167	CO-2472
Best	King, D. "King Claims 1191100, 1199901"	1999 (8)	Pr, SA, rTr	2.19882	CO-2473
Bisley	Novawest Resources Inc. "Bisley Property"	1998	Lc, IP	2.190818	KL-4488
Black	Allsopp, A. "Allsopp - Luoma Property"	1998	Pr, GL, Gc	2.19805	KL-4669
Boston	Horne, D. J. "Boston Property"	1998	Lc, GL, Pr, HLEM, M	2.19021	KL-4493
Boston	Pancham Mining Group Ltd. "Pancham Mining Group Ltd Property"	1998	Pr, sTr	2.18760	KL-4490
Bowman	Beckett, B.T. "Bowman Twp. Property"	1998	Pr, SA, Lc, GL	2.19114	KL-4515
Bowman	Cross Lake Minerals Ltd. "Bowman Township Property"	1998-1999 (9)	VLF-EM, Lc	2.19122	KL-4513
Bradette	Mines Aurizon Ltee "Secteur Bradette"	1998	M, GL, SA	2.19210	KL-4561
Briggs	Wabana Explorations Ltd. "Niemetz Property"	1998-1999 (10)	Pr, SA	2.18903	CO-2474
Bucke	Branchwater Resources Ltd. / Cabo Mining Corp. "Simon – Murray Claims"	1999 (11)	Gc	2.19630	CO-2475
Bucke	Wareing, S. "TTL Minerals Property"	1998	Pr, SA	2.19586	CO-2477
Bucke	Wareing, S. "TTL & Stellar Properties"	1998	Pr, SA	2.19585	CO-2478
Bucke, Lorrain	Branchwater Resources Ltd. "Teledyne Project"	1998	DD, SA	2.19804	CO-2476
Burt	Bastarache, G.	1998	rTr, sTr, SA	2.19190	KL-4531
Carr	Pentland Firth Vennures Ltd. "McChristie Property"	1998	Gc, SA	2.19194	KL-4525
Carr	St Andrew Goldfields Ltd. "Carr Claim 1207346 Property"	1998-1999 (12)	Gc, SA	2.19788	KL-4667
Carr	St Andrew Goldfields Ltd. "Carr Property"	1999 (13)	Gc, SA	2.19711	KL-4650
Carr	Tremblay, M. "Carr II Property"	1999 (14)	GL	2.19589	KL-4654
Cassels, Strathy	Silver Century Explorations Ltd. "Strathy Project"	1997	GL, SA	2.19604	CO-2479
Catharine	G. Kosy, W. Searles "Kosy – Searles Property"	1998	DD(2)(400')	2.18872	KL-4474
Catharine	Ploeger J.C., Larocque D." Misema Project"	1997-1998	Lc, Pr, GL, SA, sTr, rTr	2.19131	KL-4520

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Catharine	Salo A., Kosy R. "Kosy - Salo Property"	1998	Pr, SA	2.19172	KL-4522
Catharine, Katrine	Ploeger, J. "Misema & Kinabik Group, OP97-221"	1997	Lc, rTr, GL, SA		KL-4572
Catharine, Skead	Salo, A. "Catharine Twp. Property"	1997	Pr, SA	2.19377	KL-4560
Catherine	Hill, R.V. "Catharine Gold Property"	1998	Pr, SA	2.19189	KL-4523
Chambers	Blake, F. "Blake Property"	1999 (15)	M, VLF-EM	2.19703	CO-2480
Chambers	Heritage Exploration "Nellem Lake & Crash Lake Properties"	1998	GL, SA	2.18831	CO-2481
Chambers	Laronde, D. "Chambers Lake Property"	1997-1999 (16)	Lc, M, VLF-EM, HLEM, GL	2.19376, OP97-296	CO-2482, CO-2483
Chambers	Laronde, D. "Ultra Property"	1998-1999 (17)	M, VLF-EM, HLEM, GL, rTr, Pr, SA	2.18982, 2.19860	CO-2484, CO-2485
Chambers	Smith, K. "Smith Property"	1999 (18)	Lc, VLF-EM	2.19754	CO-2486
Chambers	Wabana Exploration Inc. "Chambers Township Properties"	1997	AM, AEM, Pr, SA, Lc	2.18893	CO-2487
Charters, Donovan	Lake Superior Resources Corp. "Block D – Charters/Donovan Twps"	1998	AVLF-EM, AM, ARa	2.18877	CO-2488
Churchill	Forbes, J. "Claim L – 1214375"	1999 (19)	sTr	2.18981	CO-2491
Churchill	Gestion Corpomin Inc. "Hinzer, Dirks, Dirks Shiningtree, Base & Precious Metals Property"	1999 (20)	GL, Pr, Gc, SA	2.19583	CO-2492
Churchill	Skead Holdings/ MacGregor R. A. "Claim 1225095"	1999 (21)	GL	2.19535	CO-2493
Churchill, Connaught	Baltic Resources Inc. "Churchill Option"	1998	GL, Pr, Gc, SA, Lc, VLF-EM, M, HLEM	2.18787, 2.19197	CO-2489, CO-2490
Cleaver	Cominco "Cleaver Twp. Project"	1997-1998	Lc, PEM, M	2.19278	KL-4604
Cleaver	Flinsky, W. "Flinsky Claim Property"	1997	Pr, SA, sTr, rTr	2.19277	KL-4609
Coleman	Sudbury Contact Mines Ltd. "Montreal River "B" Property"	1997-1999 (22)	Lc, M, OvD(1)(26m), SA	2.19315, 2.19319	CO-2494, CO-2495
Coleman	Watts, H. "Kittson Cobalt, Edison & Shakt Davis Mines Properties"	1997	Lc, M, VLF-EM, rTr	OP 97-045	CO-2496
Cook	Mar – Land Minerals Ltd. "Claim L843121"	1998	rTr	2.19064	KL-4533
Cook	RJK Explorations Ltd. "Cook Twp. Property"	1998	DD(4)(845m), SA	2.19176	KL-4538
Coulson	Campsall, L. "Claim L-1185466"	1998	DD(1)(48')	2.19643	KL-4642
Coulson, Knox, Warden	Sterling Pacific Resources Inc. "Shallow River Project"	1998	DD(8)(1055m), SA	2.18955	KL-4476
Currie	Golden Knight Resources Inc. "Currie Property"	1997	DD(2)(592m), SA	2.19447	KL-4626
Currie, Egan	Moss Resources/Greenshields Resources Inc. "Curregan Property"	1998	Lc, M, VLF-EM, IP	2.19641	KL-4653
Dokis, Tanahill	Marion, E. "Malamute Property"	1997-1999 (23)	VLF-EM, IP, SA, Lc, sTr, rTr, Pr	2.19204, 2.19173	KL-4559, KL-4519
Dufferin	Annett, R. "Salo Property (OPAP 1999)"	1999 (24)	DD(2)(600'), sTr, rTr, Lc, SA	2.19739	CO-2498
Dufferin, North Williams	Annett, R. "Dufferin Property"	1998	sTr, rTr, SA, DD(1)(346')	2.19354	CO-2497
Dufferin, North Williams	Minescape Exploration Inc. "McAra Lake Area"	1998	AM	2.19019	CO-2499
Dufferin, North Williams	Tindale, J. L. "Norman & Kite Lake Properties"	1997	Lc, M, VLF-EM, GL, rTr, sTr, SA	OP 97-068	CO-2500
Dufferin, North Williams	Wallbridge Mining Company Limited "Kite - McAra Lakes Property"	1998	DD(13)(2251m), SA, Lc, GL	2.19624	CO-2501
Dunmore, Terry	Kafka, G. "Claim 1222292"	1997	Bulk	2.19590	KL-4675

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Eby	Dufresne, R. "Chartre - Dufresne Property"	1998-1999 (25)	Pr, SA, sTr, rTr	2.19332	KL-4605
Eby	Robinson, D. "Eby West Property"	1997-1999 (26)	Lc, HLEM, GL, M	2.19304	KL-4528
Eby, Otto	Nastek Exploration Ltd. "Eby North Property"	1996-1998	HLEM, M, GL, Lc	2.18802, 2.18754	KL-4506, KL-4507
Edwards, Mortimer	East – West Resources Ltd. "Edwards – Mortimer Claim Group"	1998	Lc, M, HLEM	2.19188	KL-4529
Egan	Absolut Resources Ltd. "Egan Township Property"	1997	Lc, M, HLEM	2.19717	KL-4649
Elliot	559505 Ontario Ltd., A.J. Perron Gold Corp. "50-Ghost East Grid"	1998-1999 (27)	Lc, M, VLF-EM	2.18998, 2.19164, 2.19121	KL-4486, KL-4516, KL-4512
Elliot	Perron Gold Company "50-Ghost North-West Grid"	1998	Lc, VLF-EM, M	2.18990	KL-4482
Elliott	559505 "50 – Ghost grid, East/South Grid"	1999 (28)	Lc, M, VLF-EM	2.19670	KL-4647
Elliott	559505 Ontario Ltd., Perron Gold Corp. "50 - Ghost - West Grid"	1999 (29)	Lc, M, VLF-EM	2.19394, 2.19331, 2.19320, 2.19186, 2.19312, 2.19256, 2.19451, 2.19441	KL-4565, KL-4553, KL-4552, KL-4540, KL-4554, KL-4539, KL-4584, KL-4588
Elliott, Harker, Thackeray	Perron Gold Corporation "50 – Ghost - West Grid"	1999 (30)	Lc, M, VLF-EM	2.19305	KL-4555
Elliott, Thackeray	Gwen Resources Ltd. "Thackeray Lake Grid"	1999 (31)	Lc, M, VLF-EM	2.19639	KL-4641
Farr, Mickle	Lake Superior Resources Corp. "Elk Lake Property"	1996-1997	GL, SA	2.18736	CO-2502
Farr, Mickle	Lake Superior Resources Corp. "Block B – Elk Lake Area"	1998	AM, AVLF-EM, ARa	2.18869	CO-2503
Fawcett	Cashaback, A. "Claim 1211369, 1214696"	1998-1999 (32)	Lc, sTr, rTr, SA	2.19578	CO-2504
Fawcett	Fort Knox Gold Resources Inc. "Fawcett Township Property"	1998	Lc, IP, R	2.19306	CO-2505
Flavelle	Inmet Mining "West Kirkland Project"	1998	VLF-EM	2.19004	KL-4481
Frecheville	Burt, R.	1997	M, VLF-EM, Lc	2.19311	KL-4551
Frecheville, Mistaken Islands	Henriksen, G. "Backdoor Property"	1998	Lc, Pr, M, VLF-EM, GL, SA	2.19206	KL-4536
Garrison	Gwen Resources Ltd. "Silverside-64" (Gwen-64)	1999 (33)	Lc, M, VLF-EM	2.19746	KL-4658
Garrison, Harker	Barrick Gold Corp. "Stoch Block"	1998	DD(6)(885.5m)	2.19184	KL-4579
Garrison, Thackeray	Gwen Resources Ltd. "Silverside-64" (Gwen-64)"	1999 (34)	Lc, M, VLF-EM	2.19738	KL-4656
Garrison, Thackeray	Perrex Resources Inc. "Silverside - 64 (Gwen – 64)"	1999 (35)	Lc, M, VLF-EM	2.19658, 2.19684	KL-4643, KL-4646
Gauthier	559505 Ontario Ltd. "Northland Group"	1999 (36)	Lc, M, VLF-EM	2.19496	KL-4577
Gauthier	Queenston Mining Inc. "Princeton North Carb Zone"	1998-1999 (37)	DD(1)(1904'), SA, sTr, GL	2.19259, 2.19415	KL-4543, KL-4578
Gauthier	Queenston Mining Inc. "Princeton Property"	1997-1999 (38)	Lc, M, IP, DD(4)(2453')	2.19416, 2.19417	KL-4569, KL-4570
Gauthier	Queenston Mining Inc. "McBean – Anoki Area"	1997	DD(10)(21,128'), SA	2.19325	KL-4548
Gauthier	Queenston Mining Inc. "McBean Property"	1998-1999 (39)	DD(2)(7390'), SA	2.19503	KL-4614
Gauthier	Queenston Mining Inc. "Munro Grid Area"	1998-1999 (40)	DD(5)(5427'), SA	2.19453, 2.19458	KL-4589, KL-4590
Gauthier	Queenston Mining Inc. "Princeton, McBean-Anoki, Munro, Canico"	1997-1999 (41)	DD(19)(34,927'), SA	2.19504	KL-4606
Gauthier, Hearst, McElroy, McVittie, Skead	MacGregor, R.A. "MacGregor Option"	1998-1999 (42)	Gc, SA	2.19307	KL-4634
Gillies Limit	Branchwater Resources Ltd. "Claim S1217689"	1998	Pr, SA, sTr	2.19056	CO-2506

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Gillies Limit	Branchwater Resources Ltd. "Claim S1217754"	1998	Pr, SA, sTr	2.19050	CO-2507
Gillies Limit	Chitaroni, G. "Copperville Property"	1999 (43)	Lc, VLF-EM, M	2.19808	CO-2510
Gillies Limit	Chitaroni, G. "Whitney Lake Property"	1998-1999 (44)	GL, Lc, HLEM, M, SA	2.19157	CO-2511
Gillies Limit	Outcrop Exploration Limited "Cumming Pits"	1996-1998	sTr, SA	2.18912	CO-2513
Gillies Limit	Outcrop Explorations Ltd. "Consolidated Professor Mines Adit"	1998	Pr, Ug	2.18999	CO-2512
Gillies Limit	Outcrop Explorations Ltd. "Waldman Property"	1998	sTr, rTr	2.18899	CO-2514
Gillies Limit	Outcrop Explorations Ltd./ Cabo Mining Corp. "Claim 1212225"	1998-1999 (45)	Micro, GL	2.19729	CO-2515
Gillies Limit, Lorrain	Branchwater Resources Ltd. "Gillies Limit & Lorrain Project"	1999 (46)	AM, AEM, AVLF	2.19418	CO-2508
Gillies Limit, Lorrain	Branchwater Resources Ltd./ Cabot Mining Corp. "South Lorrain Claim Block Area"	1999 (47)	Gc, SA	2.19616	CO-2509
Gillies Limit, Lorrain	Simpson, M. "Lang-Caswell Project & Claim 1217754"	1998	Pr, SA	2.19051	CO-2516
Grenfell	Anglaumaque Explorations Inc. "Cook Lake Prospect"	1998	M, VLF-EM	2.19579	KL-4630
Grenfell, Teck	2973090 Canada Inc. "Cook Lake Prospect"	1998	GL, Pr, SA	2.19183	KL-4598
Guibord	Pangea Fenn-Gib Ltd. "Fenn - Gib"	1998	DD(13)(1947.6m), SA	2.19045	KL-4495
Guibord, Michaud	Pentland Firth Ventures Ltd. "Marchaud Property Garrison Creek J.V."	1997	DD(18)(6978m), SA	2.19745	KL-4660
Guibord, Munro	Salo, R. "Guibord - Munro Property"	1997-1999 (48)	Pr, SA, sTr, rTr	2.19353	KL-4610, KL-4576
Harker	Barrick Gold Corporation "Sims Block"	1998	DD(2)(278m)	2.19187	KL-4581
Harker, Lamplugh	Bouzane, D. "Bouzane Claims"	1999 (49)	Gc, SA	2.19762	KL-4664
Haultain	Bilenki, P. "Haultain Project"	1997	Lc, VLF-EM, Pr, SA	OP 97-319	CO-2517
Haultain	Bowen, L. N. "Rawhide Shaft Property"	1998	Pr, SA	2.18800	CO-2518
Haultain	Russer, M.; Zabudsky, D. "Lost Lake Property (Wigwam Mine)"	1998	Pr, rTr, SA	2.18887	CO-2521
Haultain, Knight, Lawson, Milner, Nicol, Tyrrell, Van Hise	Lake Superior Resources Corp. "Gowganda – Elk Lake Project"	1999 (50)	GL, SA	2.19013	CO-2520
Haultain, Knight, Lawson, Milner, Nicol, Van Hise	Lake Superior Resources Ltd. "Block "A" – Gowganda Area"	1998	AM, ARa	2.18788	CO-2519
Hearst, McElroy, Skead	Skead Holdings Ltd. "Hearst, McElroy & Skead Twp. Property"	1998-1999 (51)	Gc, SA	2.19308	KL-4601
Hearst, McVittie	NFX Gold Inc. "Gold Dollar Property"	1996-1998	rTr, SA	2.18499	KL-4645
Hepburn	Seal River Exploration "Departure Creek Property"	1998	DD(1)(155m), SA, GL	2.18920, 2.18920	KL-4480, KL-4478
Hislop	St Andrew Goldfield Ltd. "Hislop Claim 1206789 Property"	1999 (52)	Gc, SA	2.19811	KL-4677
Hislop	St Andrew Goldfields Ltd. "Hislop Claim 1207338 Property"	1999 (53)	Gc, SA	2.19795	KL-4670
Hislop	St Andrew Goldfields Ltd. "Hislop Claim 1207339 Property"	1999 (54)	Gc, SA	2.19789	KL-4665

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Holloway, Marriott	Perron Gold Corp. "101 Property"	1999 (55)	Lc, VLF-EM, M	2.19395, 2.19203	KL-4620, KL-4532
Hudson	Walton, G. H. "Walton Properties"	1998	Lc, M	2.19310	CO-2522
Hudson	Winsdor, K. "Claim 1200474"	1998	Pr, Lc, SA	2.18987	CO-2523
Iroquois Point, Sulphur Island	Mustang Minerals Corp. "Lake Abitibi PGE Property"	1999 (56)	Lc, M, VLF-EM, DD(5)(396m), SA	2.19763, 2.19814	KL-4659, KL-4678
James, Tudhope	Cusil Venture Corp. "Merico – Ethel Property"	1998	DD(4)(1350m), SA	2.19588	CO-2524
James, Tudhope	Jkate Explorations Ltd. "Beaver Pond Project"	1998	Pr, GL, sTr, rTr	2.19316	CO-2525
Katrine	Larocque, D.; Larocque, E.; Ploeger, J. "Row - Katrine Property"	1997-1998	sTr, rTr	2.19205	KL-4530
Katrine	Ploeger, C.J. "Kinabik Property"	1996-1998	Lc, Pr, GL, SA, rTr, sTr	2.18997	KL-4489
Kelvin	Anderson, S. "Kelvin Twp. Property"	1997	Lc, HLEM, M	2.19321	CO-2526
Kelvin, Kemp	Orogrande Resources Inc. "Grassy Lake Project"	1998	DD(2)(106m)	2.19103	CO-2527
Kimberley	Hunt, G. "Kimberly Twp."	1998	Lc, sTr, Pr, SA	2.18916	KL-4521
Knight	Temex Resources Ltd. "Pigeon Lake Property"	1998	Pr, SA	2.19193	CO-2529
Knight, Natal	Copper Dome Mines Ltd. "Decker Property"	1998	GL, SA	2.18781	CO-2528
Lamplugh	Hawley, P., Ferderber, H." Caterpillar Project"	1997	Lc, Pr, M, VLF-EM, GL, SA	2.19207	KL-4541
Lamplugh	Henriksen, G. "Makua Bay Property"	1998	Lc, Pr, M, VLF-EM, GL, SA	2.19208	KL-4527
Lamplugh	Henriksen, G. "Starting Gate - Delta Property"	1998	Lc, Pr, M, VLF-EM, GL, SA	2.19275	KL-4526
Lamplugh	Xemac Resources Inc. "Lamplugh Twp. Gold Property"	1998	Lc, M, VLF-EM, GL	2.18979	KL-4545
Law, Strathcona	Temex Resources Ltd. "Wilson Lake Claims"	1999 (57)	SA	2.19409, 2.19679	CO-2530, CO-2531
Law, Strathcona	Temex Resources Ltd. "Herridge-Wilson Lake Property"	1999 (58)	Lc, M	2.19710	CO-2532
Lawson	Lake Superior Resources Ltd. "Claim 1223919"	1998	sTr, Pr	2.19523	CO-2533
Lebel	Kinross Gold Corp. "Continental Gold Mine Property"	1998	PW, IP	2.19012	KL-4483
Lebel	Queenston Mining Inc. "Munroe Project"	1999 (59)	Lc, M, VLF-EM	2.19827	KL-4681
Lebel	Queenston Mining Inc. "Pawnee South Property"	1999 (60)	Lc, M, VLF-EM	2.19819	KL-4674
Lebel	Raven Resources Inc. "Claim 1220018"	1999 (61)	sTr, SA, SA	2.19784	KL-4666
Lebel	Raven Resources Inc. "King Kirkland Property"	1998	DD(1)(553'), SA	2.19015	KL-4484
Leonard	Burda, D. "Shinning Tree Airborne Consortium"	1998	ARa, AEM, AM	2.19760	CO-2534
Leonard	Hanych, W. "Spider Lake Property"	1998-1999 (62)	GL, SA	2.19598	CO-2535
Leonard	Lacarte, A. "Old Red Project"	1999 (63)	rTr, sTr, GL	2.19631	CO-2536
Leonard	Orogrande Resources Inc. "Shinning Tree and Old Red Projects"	1998	Lc, M, VLF-EM, SA, GL	2.18996	CO-2537
MacMurchy	KRL Resources Ltd. "Copper Hill Property"	1998-1999 (64)	Lc, AM, ARa, PEM, M, VLF-EM, DD(2)(867m), SA	2.19687, 2.19712	CO-2538, CO-2539
MacMurchy	Strike Minerals Inc. "Rhonda Vein"	1999 (65)	rTr	2.19001	CO-2540

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Maisonville	Opawica Explorations Inc. "Maisonville Twp. Base Metal Property"	1998	DD(5)(1167m)	2.19344	KL-4556
Marriott	Battle Mountain Canada Ltd. "Stoughton Property"	1998	DD(3)(582m), SA	2.19817	KL-4679
Marriott	Gwen Resources Ltd. "101 Group"	1999 (66)	DD(3)(703m)	2.19397	KL-4564
Marriott	Plato Gold Corporation "Marriott Twp. Properties"	1997	Lc, M, IP	2.19435	KL-4563
Marriott	Queenston Mining Inc. "Holloway Project"	1998	DD(2)(825m), SA	2.18983	KL-4492
McCool	Marl Resources/Pelangio-Larder Mines	1999 (67)	DD(2)(160m)	2.19494	KL-4594
McCool	Pelangio Larder Mines Ltd. "McCool Syncline Group"	1999 (68)	PEM, M	2.19263	KL-4537
McCool	Prism Resources "McCool Property"	1998	DD(2)(395.6m), Pr, SA, M, HLEM, Lc	2.19046, 2.19063, 2.19017	KL-4498, KL-4499, KL-4487
McElroy	Burns, J. "McElroy Twp. Property	1998	GL, M, VLF-EM, DD(1)(137m), SA	2.19380	KL-4592
McElroy	Notra Developments Corp, "Misema River Property"	1996-1998	OvD(2)(98.7m), Lc, SA	2.18725, 2.18726	KL-4510, KL-4511
McElroy	Sudbury Contact Mines "McElroy Project, 196 Property"	1996-1997	OvD(6)(370m), SA	2.18900	KL-4542
McGarry	Beckett, T.B. "Foxearth Lake Property"	1998	Lc, VLF-EM, Pr, SA, Beep	2.19120	KL-4517
McGarry	Cyprus Canada Inc. "Kerr Mine"	1993	DD(8)(9191'), SA		KL-4600
McGarry	Salo, A. "Claim # L-1187014"	1999 (69)	Pr, SA	2.19777	KL-4661
McGarry	Salo, A. "Claim # L-1200023"	1999 (70)	Pr, SA	2.19779	KL-4657
McGarry	Salo, A. "Salo - Green McGarry Property"	1998	Pr, sTr, SA	2.19191	KL-4546
McGarry, McVittie	Salo, A., Beckett, T. "Salo - Beckett Bear Lake Property"	1998	IP, Pr, PW	2.18746	KL-4477
McNeil	Oliver Group/Alda Industries "McNeil Project"	1997	Lc, GL, SA	2.19309	KL-4628
McVittie	Fey, C. "Kirvit Property"	1997-1998	Lc, M, VLF-EM, rTr, GL, SA	2.19378	KL-4568
McVittie	Horne, J.D. "Omega North Property"	1998	Pr, SA	2.18989	KL-4479
McVittie	MacGregor, R. "Raven River Property"	1998	DD(1)(2,498')	2.19020	KL-4550
McVittie	NFX Gold Inc. "Fernland Property"	1998-1999 (71)	DD(6)(11096'), SA	2.19452	KL-4644
Melba	Healy, D., Porritt, D. "Cochenour Creek Copper Project"	1998	Lc, Pr, SA, HLEM, SP	2.19293	KL-4549
Michaud	Beagan, R., Hagan A. "Gem Lake Property"	1998	IP	2.19438	KL-4583
Michaud	Dyment, M., Kidston, J., Obradovich, T. "Modk Michaud Property"	1999	Lc, M	2.19437	KL-4567
Michaud	Moneta Porcupine Mines Inc. "Michaud Twp. Property"	1998-1999 (72)	Lc, IP	2.19262	KL-4535
Michaud	Pentland Firth Ventures "Garrison Creek JV: Marchaud Property"	1997-1998	DD(6)(1411m), SA	2.19623	KL-4637
Midlothian	Mullen, D. "Midlothian Twp. Property"	1997	VLF-EM, M, IP, Gc, SA		KL-4575
Midlothian	Orezone Resources Inc. "Midlothian Project"	1998-1999 (73)	IP, R, Lc, M, HLEM	2.19769, 2.18878	KL-4655, KL-4503
Midlothian	Pyke, D.R. "Midlothian Township Project"	1997	M, IP	2.18980	KL-4485
Mond	Pegg, C./Whelan, R. "Halliday-Mond Twp. South Grid"	1997-1998	DD(1)(188')	2.19481	CO-2541
Morrisette	McCombe, B. "B. McCombe Property"	1997-1999 (74)	Lc, M, HLEM, GL	2.19314	KL-4621

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Morrisette	Medici Mineral Corp. "Morrisette Project"	1999 (75)	DD(2)(541m), SA	2.19707	KL-4651
Mortimer	Cross Lake Minerals Ltd. "Mortimer Property"	1999 (76)	DD(4)(850m),SA	2.19577	KL-4629
Munro	Dyment, M., Kidston, J. "Dyment - Kidston Plunge Property"	1999 (77)	Lc, M	2.19420	KL-4586
Munro	Lalonde, D. "Lalonde Munro Property"	1998	rTr	2.18915	KL-4547
Munro	Patrick Harrison Global Investments Ltd. "Potter Mine Property"	1997-1998	DD(20)(31,781'), SA, DGP, GL	2.19398	KL-4638
Nordica	Band-Ore Resources Ltd. "Windward"	1998	DD(4)(738m), SA	2.19708	KL-4652
North Williams	Lacarte A. "North Williams – Ireland Project"	1999 (78)	sTr	2.19580	CO-2542
Noseworthy	Newmont Exploration of Canada "Mikwam Joint Venture"	1998	Lc, Gc, SA	2.19081	KL-4504
Ogilvie	Lacarte, R. "Lacarte Claims"	1998	sTr	2.18978	CO-2543
Ossian	1125570 Ontario Inc. "Ossian Project"	1998	M, VLF-EM	2.18755	KL-4475
Ossian	Silver Century Explorations Ltd. "Labyrinth Lake & Ossian Gold Mine Project"	1998	Lc, PEM, DGP, IP, M, DD(2)(1076m), SA	2.19587	KL-4668
Ossian	Silver Century Explorations Ltd. "Ossian Gold Mine/Boudreault-Labbe Property"	1997	DD(10)(2081m), SA	2.19182	KL-4613
Ossian	Silver Century Explorations Ltd. "Ossian Property Projects 354, 356"	1997	OvD(6)(198m), SA	2.19272	KL-4544
Pacaud	Boston Creek Mines Ltd. "Boston Creek Property"	1997	Lc, M	2.19505	KL-4596
Pense	Novawest Resources Inc. "Golden Poly Property"	1997-1998	DD(1) 158m	2.18995	CO-2544
Powell	Abitibi Mining Corp. "Campbell Project"	1996-1997	GL, Gc, SA, sTr	2.19516, 2.19517	KL-4608, KL-4640
Powell	Fekete M., Ferderber R. "Caddy Prospect"	1998-1999 (79)	Lc, Pr, SA, Gc, M, VLF-EM, rTr	2.19450	KL-4625
Powell	Kiernicki F. "Copper Mountain Project"	1996	sTr	2.18993	KL-4508
Powell	Sedex Mining Corp. "Oka Project"	1996-1998	GL, sTr, rTr, SA, DD(15)(2593m)	2.19518, 2.19442	KL-4612, KL-4623
Powell	Sedex Mining Corp. "Welsh Stanwick Project"	1996-1997	DD(5)(922m), SA	2.19519	KL-4611
Rand	Aur Resources "Le Crapeau Property"	1997	Pr, GL, SA, M, VLF-EM	2.18984	KL-4491
Raymond	J. D. Horne & Associates, Skead Holdings Ltd. "Raymond Nickel Prospect"	1998	DD(1)(190m), SA	2.19531	CO-2545
Sharpe	Grabowski, R. "Claim 1203480"	1998	sTr, rTr	2.19718	KL-4680
Skead	Kelnick Resources Ltd. "Neiman Option-Zebudsky-Skidoo Lake Zone"	1997-1998	DD(7)(542m), SA	2.19260	KL-4622
Skead	MacGregor R. A./Skead Holdings "Lincoln - Nipissing Project"	1997-1998	Gc, SA	2.19257	KL-4633
South Lorrain	Gore, J. A. "John Gore Properties"	1997-1998	Lc, M, VLF-EM, Pr, SA, sTr, rTr	OP97-004, 2.18799	CO-2546, CO-2547
South Lorrain	Hanes, D. "Windy Lake Claims"	1998	Pr, SA	2.19271	CO-2548
South Lorrain	Hanes, D.; MacLachlan, J; Plunkett, S. "Windy Lake Claims"	1998	Pr, SA	2.19049, 2.19273	CO-2549, CO-2550
South Lorrain	Kreise, K. H. "Friday Mine"	1997	Lc, Gc	2.18718	CO-2551

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South Lorrain	MacLachlan J; Hanes D; Plunkett S. "Claim 1230294"	1998	Lc, M, VLF-EM	2.19276	CO-2553
South Lorrain	Maclachlan, J.; Hanes, D.; Plunkett, S. "Windy Lake Claims"	1998	Pr	2.19185	CO-2552
South Lorrain	Moore, H. "Pothole South Property"	1998	Lc, M, VLF-EM	2.19419	CO-2554
South Lorrain	Wolverine Exploration and Mineral Recovery "Claims 1198178, 1198287"	1998	Pr, SA	2.19265	CO-2555
Strathcona	Irvine, W. "Claim 1212075"	1999	rTr, SA	2.19709	CO-2556
Strathcona	Redstar Resources Corp. "Jessie Lake Property"	1996-1998	Pr, sTr, SA	2.18892, 2.18913, 2.18904	CO-2557, CO-2558, CO-2559
Strathy	Blake, F. "Group of Four"	1994	Lc, GL, sTr, rTr, SA	2.19490, 2.19488	CO-2560, CO-2561
Strathy	Guppy, C. "Guppy Claims, Bernice Lake"	1998	sTr, rTr, SA	2.19060	CO-2562
Strathy	King, D. "King Claim 1076672"	1999 (80)	Pr, SA	2.19645	CO-2563
Strathy	Laronde, D. "Arsenic Lake Property"	1998	Lc, M	2.19318	CO-2564
Strathy	Webster , B. "Webster Property"	1997-1999 (81)	DD(1)(350'), SA, IP	OP97-350, 2.19105	CO-2565, CO-2566
Strathy	Youngs, B. "Alfreda Lake Property"	1998-1999 (82)	M, VLF-EM, Lc	2.19156	CO-2567
Tannahill	Sedex Mining Corp./Abitibi Corp. "Tannahill Project"	1996-1997	rTr, SA, Gc, SA, DD(40)(6171m)	2.19439, 2.19047	KL-4624, KL-4562
Tannahill	Sheldon-Larder Mines Ltd. "Magusi Property"	1997	Lc, M, VLF-EM	2.19313	KL-4632
Taylor	Nufort Resources "Taylor Group"	1998	M, VLF-EM	2.19054	KL-4497
Taylor	St Andrew Goldfields Ltd. "Taylor East"	1999 (83)	DD(1)(212m)	2.19497	KL-4587
Taylor, Walker	Pentland Firth Ventures Ltd. "Pipestone Project"	1999 (84)	Lc, M, VLF-EM	2.19485	KL-4639
Teck	Kinross Gold Corp. "Narrows Break"	1998	DD(16)(8,463'), SA	2.19317	KL-4597
Teck	Kinross Gold Corp. "Teck Twp. Claims"	1998-1999 (85)	M, GL, rTr, Lc, IP	2.19324, 2.19083	KL-4631, KL-4509
Thackeray	Gwen Resources Ltd. "Silverside - 64"	1999 (86)	Lc, M, VLF-EM	2.19669, 2.19714, 2.19713	KL-4648, KL-4662, KL-4663
Thackeray	Gwen Resources Ltd. "Thackeray Lake (New North-South Grid)"	1999 (87)	GL	2.19632	KL-4676
Thackeray	Perrex Resources "McKinley Lake Grid"	1999 (88)	Lc, M, VLF-EM	2.19532, 2.19534	KL-4602, KL-4603
Thackeray	Perrex Resources Inc. "New North/South Grid"	1999 (89)	Lc, M, VLF-EM	2.19457	KL-4585
Thackeray	Perron A., Perrex Resources, Gwen Resources "Thackeray Lake Grid"	1999 (90)	Lc, M, VLF-EM	2.19560, 2.19626	KL-4619, KL-4636
Thackeray	Perron, A., Perrex Resources, Gwen Resources "Thackeray Lake Grid " New North-South Grid"	1999 (91)	Lc, M, VLF-EM	2.19558	KL-4618
Tyrrell	407824 Alberta Ltd. "Claim L 1221667"	1998	GL	2.18874	CO-2568
Tyrrell	407824 Alberta Ltd. "Claim L 1221669"	1998	GL, SA	2.18873	CO-2569
Tyrrell	Battle Mountain Canada Ltd. "Claim 1190031"	1998	sTr	2.19014	CO-2570
Tyrrell	Goldeye Explorations Ltd. "Tyrrell Property"	1998	DD (16)(3882m), GL, SA	2.18785, 2.19326	CO-2571, CO-2572
Van Nostrand	Mortimer, C. "Van Nostrand Property"	1999 (92)	Lc, Pr, VLF-EM, M, SA	2.19396	CO-2573
Walker	Cosby, M. "M. Cosby Walker Property"	1999 (93)	DD(1)(650'), SA	2.19495	KL-4593
Warden	Falconbridge Ltd. "Granges Option"	1998	DD(1)(233m), SA	2.19195	KL-4524

Township	Company Name "Property Name"	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Wilkie	Kidston, J. "Claim 1222494"	1999 (94)	Lc, Pr, GL, VLF-EM	2.19807	KL-4671
Wilkie	Kidston, J. "Claim 1225422"	1999 (95)	Lc, Pr, GL, VLF-EM	2.19806	KL-4673
Willet	Lake Superior Resources "Block C – Willet Twp. Area"	1996-1998	AM, AVLF-EM, ARa, GL, SA	2.18870	CO-2574
Yarrow	Opawica Explorations Inc. "Matarrow Mine Project"	1996	Lc, M, IP	2.19264	KL-4580

Table 4. Exploration activity in the Kirkland Lake Regional Resident Geologist's District - 1999.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
BS ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
Gc ..... Geochemical survey
GL ..... Geological Survey
GP ..... Ground Geophysics unspecified type
Gv ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
IP ..... Induced polarization survey
Lc ..... Linecutting
M ..... Ground magnetic survey
Met ..... Metallurgical testing
OvD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
OMIP ..... Ontario Mineral Incentive Program
OPAP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
Pr ..... Prospecting
R ..... Resistivity survey
SA ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
sTr ..... Stripping
rTr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLF-EM ..... Very low frequency electromagnetic survey

No.	Company/Individual (Occurrence Name) or Property	Township/Area	Exploration Activity*
1-95	See Table 3		
96	Cunningham, L.	Alma	Pr, GP, DD, SA, OPAP
97	Collin, Y.	Argyle, Bannockburn	Lc, Pr, GL, SA, GP, OPAP
98	Grant, J.C.	Argyle, Bannockburn	Lc, Pr, GL, SA, GP, OPAP
99	Salo, L.	Asquith	GL, GP, sTr, DD, SA, OPAP
100	Vallier, B.	Baden	Pr, GL, sTr, SA, OPAP
101	Bannister, C. – Boyce, E.	Baden, Powell	Pr, GL, GP, DD, SA, OPAP
102	Boulder Mining Corporation	Barnet	DD(4), GL, Lc, M
103	Sutton, M.	Ben Nevis	GP, DD, SA, OPAP
104	Croxall, J.E.	Benoit	GP, Pc, OPAP
105	Kangas, M.	Benoit	DD, SA, OPAP
106	Webster, C.	Bernhardt	Pr, GP, sTr, SA, OPAP
107	Altsopp, A. – Luoma, W.	Black	Lc, GP, GL, SA, OPAP
108	Black, A. – Leahy, M.	Black	GP, DD, SA, OPAP
109	Forbes, J.H.	Black	Lc, GP, Pr, SA, OPAP
110	Expariate Resources Ltd. – Echo Bay Mines Ltd. (Cook JV)	Bowman, Currie	OvD(6), SA
111	Northway Explorations Limited	Briggs	DD

No.	Company/Individual (Occurrence Name) or Property	Township/Area	Exploration Activity*
112	Von Cardinal, T.	Briggs	Lc, Pr, GP, SA, OPAP
113	Bastarache, G.	Burt	Pr, GL, GP, sTr, SA, OPAP
114	St Andrew Goldfields Ltd.	Carr	Gc
115	Garvey, R.	Catahrine, Skead	Lc, GP, Gc, Pr, OPAP
116	Link, T.	Catharine	DD(6), SA
117	Blake, F.	Chambers	Lc, GP, GL, SA, OPAP
118	MacDonnell, A.	Chambers	Lc, GP, DD, SA, OPAP
119	Smith, K.	Chambers	Pr, GP, GL, sTr, SA, OPAP
120	Stephenson, C.	Charters, Ray, Corkill	Pr, GL, Gc, SA, OPAP
121	Campbell, K.B.	Chelsey Bay, Kerrs	Pr, SA, GP, GL, Gc, OPAP
122	Link, T.	Clifford	DD, GP, OPAP
123	Germundson, R.	Cook	Pr, GL, GP, SA, OPAP
124	Ploeger, C.J.	Corkill	Lc, GP, SA, Pr, OPAP
125	Tres-Or Resources Ltd. (Shallow River, Shallow River East)	Coulson, Knox, Warden, Wilkie	Lc, HLEM, M, GL, Pr
126	Morris, J.	Dack	GL, GP, SA, OPAP
127	Carreau, A. – Marion, E.	Dokis, Tannahill	GP, sTr, DD, SA, OPAP
128	Salo, J.A.	Dufferin	GP, sTr, SA, DD, OPAP
129	Huston, C.	Eby	Pr, GL, GP, sTr, SA, OPAP
130	Atapa Minerals Limited	Gauthier	DD(4)(14100')
131	Queenston Mining Inc. – Franco-Nevada Mining Corporation Limited	Gauthier, Lebel	GL, DGP
132	Chitaroni, G.	Gilles Limit	Lc, GP, Pr, DD, SA, OPAP
133	Goddard, D.L.	Gilles Limit	PG, P, Gc, OPAP
134	McCombe, B. – Robinson, D.	Grenfell	GL, GP, sTr, SA, OPAP
135	St Andrew Goldfields Ltd.	Guibord	DD(21)(1430m), SA
136	Bouzane, D.	Harker, Lamplugh	Gc, DD, SA, OPAP
137	St Andrew Goldfields Ltd.	Hislop	DD(1)(363m), SA
138	Battle Mountain Gold (BlacktopProperty)	Holloway	DD(3), SA
139	Battle Mountain Gold (Teddy Bear)	Holloway	DD
140	O'Connor, T.	Holloway	Lc, GP, OPAP
141	Fekete, M.	Holmes	Pr, GP, sTr, SA, OPAP
142	Pinkerton, G.D.	James	Pr, GL, GP, sTr, SA, DD, OPAP
143	LaRocque, D.	Katrine	Lc, GP, GL, sTr, SA, OPAP
144	Anderson, S.	Kelvin	Pr, SA, Beep, Lc, GP, OPAP
145	KcKinnon, D.	Kelvin	Lc, GP, Pr, SA, OPAP
146	Lourim, J.	Kimberley	sTr, SA, Gc, GL, OPAP
147	Burda, D. – Thurston, M.	Knight	Pr, GP, sTr, DD, SA, OPAP
148	Mullen, D.V.	Knight, Tyrrell	Lc, GL, GP, Pr, SA, OPAP
149	Campbell, R. – Henriksen, G.	Lamplugh	Lc, GL, GP, Gc, Pr, SA, OPAP
150	Laing, D.L.	Lebel, Teck	Lc, Pr, GL, GP, sTr, SA, OPAP
151	Racicot, F.C.	Leonard, Tyrrell	Lc, Pr, SA, GL, GP, SA, Gc, OPAP
152	KRL Resources Corp.	Macmurchy	DD(2), SA, Lc, M, VLF-EM
153	Fischer, P.E.	Maisonville	GL, GP,DD, SA, OPAP
154	Marl Resources Corp. – Pelangio-Larder Mines, Limited	McCool	DD(2)(160m), SA
155	Salo, A.J.	McGarry	SA, sTr, DD, OPAP
156	Fey, C.J.	McVittie	Lc, GP, sTr, GL, SA, OPAP
157	Harrington, M.	McVittie	DD, GP, GL, SA, OPAP

No.	Company/Individual (Occurrence Name) or Property	Township/Area	Exploration Activity*
158	NFX Gold Inc. – Fort Knox Resources Inc.	McVittie, McGarry	SA, sTr,
159	Skeries, R.	Michaud, Garrison	GP, Gc, OPAP
160	Randsburg International Gold Corp.	Milner, Van Hise	DD(2), SA
161	Cross Lake Minerals Ltd. - Fairhaven Resources Ltd.	Mortimer	DD(4)(850m), SA
162	Godin, R.	Munro	GP, DD, Le, OPAP
163	Lalonde, D.	Munro	GP, DD, Le, OPAP
164	Millstream Mines Ltd.	Munro	DD(7), SA, IP
165	Kiernicki, F.	Powell	Pr, sTr, SA, GL, GP, OPAP
166	Kretschmar, U.H.	Rankin	Pr, sTr, SA, GL, GP, OPAP
167	Triex Resources Ltd. – Burns, J.	Raymond	DD(1)(362m), SA, Pr, GL, OPAP
168	Dunn, G.C.	Sheba	Pr, GL, SA, OPAP
169	Healy, D.	Shillington	Pr, SA, GP, GL, SA, OPAP
170	Keast, T.	Shillington	Pr, SA, GP, GL, Le, OPAP
171	Gore, J.A.	South Lorrain	Le, GP, sTr, GL, SA, OPAP
172	MacLachlan, J.M.	South Lorrain	sTr, GL, Gc, DD, OPAP
173	Horne, J.D.	Steele	Le, Pr, GL, GP, sTr, SA, OPAP
174	Adomaitis, P.G. - Bambic, P.	Stoughton	Le, GP, GL, Gc, SA, OPAP
175	Battle Mountain Gold Company (STAZ)	Stoughton	DD(8), SA
176	Grenier, R.	Stoughton	Le, GP, GL, Gc, SA, OPAP
177	Gauthier, R.	Strathcona	Pr, GL,GP, SA, OPAP
178	Laronde, D.	Strathcona	Pr, GL, GP, SA, OPAP
179	Wassenaar, W.	Strathcona	Le, Pr, GP, GL, OPAP
180	Webster, B.	Strathy	GP, DD, SA, OPAP
181	Shelp, G.	Tannahill	Le, GP, Pr, SA, OPAP
182	St Andrew Goldfields Ltd.	Taylor	DD(1)(334m), SA
183	Rivard, F.	Teck	Pr, GL, GP, SA, Le, OPAP
184	Goldeye Explorations Limited	Tyrrell	DGP, IP
185	Pelangio-Larder Mines, Limited – Battle Mountain Gold – Marl Resources Corp.	Tyrrell	DD(4)(616m), SA
186	Tres-Or Resources Ltd. (Botany)	Warden	Le, HLEM, M, GL, Pr
187	Dyment, M. – Kidston, J.	Wilkie	Le, GP, Pr, SA, OPAP

* *Exploration activity is listed if known.*

Table 5. Property visits conducted by the Kirkland Lake Regional Resident Geologist and Staff in 1999.

Number (keyed to Figure 2)	Property/Occurrence (MDI Number)*
1	Acana (MDI31M04NE00040)
2	Besterache (N/A)
3	Big Dan (MDI31M04SW00023)
4	Bigelow, V. (NEW)
5	Boston Creek, Picrite (N/A)
6	Boyce, Banister (N/A)
7	Burns – Raymond (N/A)
8	Consolidated Professor (MDI31M05SE00117)
9	Cumming Pits (MDI31M05SE00136)
10	Cuniptau Silica (MDI31M04NE00010)

Number (keyed to Figure 2)	Property/Occurrence (MDI Number)*
11	DanLou (MDI31M04NE00044)
12	Davidor (MDI42A08SE00009)
13	Diadem (MDI31M04SW00077)[1]
14	DK-Garnet-Epidote (N/A)
15	Fenn-Gib (MDI42A09SE00054, MDI42A09SE00187)
16	Firstbrook Quartzite (N/A)
17	Gondor-Atkins (NEW)
18	Gore (NEW)
19	Granite Lake-James Lake (MDI31M04NE00050)
20	Grenfell Kirkland (MDI42A01NE00002)[1]
21	Guppy (NEW)
22	Hagen, Ole (MDI42A08SE00114)
23	Hillcrest (MDI31M13SW00002)[1]
24	Hislop Mine (MDI42A08NW00108)
25	Hornet Lake (N/A)
26	Hwy 11 Pit (N/A)
27	Iris (MDI32D05NW00021)
28	Jessie Lake (Pipeline) (MDI31M04NE00048)
29	Kanichee (MDI31M04SW00022)
30	Laing (MDI32D04SW00126)
31	Laskowski, H. (MDI31M13NW00051)
32	Leckie (MDI31M04SW00090)
33	Legend (MDI42A08SW00024)
34	Link-Catharine[1]
35	Lowell Lake (MDI31M04NE00074)
36	MacLean (NEW)
37	Malamute (Marion E. & Carreau A.) (N/A)
38	Martin-Bird (MDI32D04SE00143)[1]
39	Match, Stanwick, Woman River (MDI42A02SE00021)
40	Northland Pyrite (MDI31M04NE00002)
41	O'Connor (MDI31M04SW00072)[1]
42	Savard Lake (MDI321L13NW00017)
43	Scotvold-Nelson (MDI42A08SE00005)
44	Shouinard (NEW)
45	Temagami Traprock (NEW)[1]
46	West Zone, Hislop Mine (Goldpost West) (MDI42A08SW00020)
47	Whitney Lake (MDI31M04NE00048)
48	Windward (MDI42A08EE00007)
49	Woman River (MDI42A02SE00030)

1 Described in "Property Examinations" section, this report.
NEW – MDI number to be created
N/A – Does not meet the minimum requirements for an MDI

Table 6. Publications received by the Kirkland Lake Regional Resident Geologist's Office in 1999.

Title	Author	Type and Year of Publication
Summary of field work and other activities 1998		Ontario Geological Survey, Miscellaneous Paper 169, 283p. 1999 (102169)
Summary of field work and other activities 1999		Ontario Geological Survey, Open File Report 6000 1999 (106000)

Title	Author	Type and Year of Publication
Abstracts Volume 24		Geological Association of Canada, Mineralogical Association of Canada Joint Annual Meeting, Laurentian University, v.24, 144p. 1999 (148044)
Late Archean rock types and controls on gold mineralization in the souther Abitibi greenstone belt of Ontario	Ayer, J., Berger, B., Johns, G., Trowell, N., Born, P. and Mueller, W.	Geological Association of Canada - Mineralogical Association of Canada, Joint Annual Meeting, GAC-MAC Sudbury 1999, Field Trip B3 Guidebook, 73p. 1999 (149041)
Geological compilation of the Lake Abitibi area, Abitibi greenstone belt	Ayer, J.A., Berger, B. and Trowell, N.F.	Ontario Geological Survey, Preliminary Map P.3398, scale 1:100 000 1999 (403398)
A comparative analysis of enzyme leach and mobile metal ion selective extractions; case studies from glaciated terrain, northern Ontario	Bajc, A.F.	Journal of Geochemical Exploration, v.61, p.113-148 1998 (15165)
Geological compilation, Bowyer, Coulson, Gaina, Kerrs, Knox, Marathon, Milligan, Moody, Purvis, Steele and Warden Townships	Barrie, T.C.	Ontario Geological Survey, Preliminary Map P.3392, scale 1:20 000 1999 (403392)
Geological compilation, Fox, Stimson, Pyne, Mortimer, Sherring, Aurora, Edwards, Wesley, Calvert, Terry and Rickard Townships	Barrie, T.C.	Ontario Geological Survey, Preliminary Map P.3393, scale 1:20 000 1999 (403393)
Geological compilation,Beatty and Munro Townships	Barrie, T.C.	Ontario Geological Survey, Preliminary Map P.3395, scale 1:20 000 1999 (403395)
Archean neptunian fissures and early history of the Destor-Porcupine fault zone, Timmins, Ontario, Canada	Beavon, R.V.	Canadian Journal of Earth Science, v.35, p.1402-1407 1998 (15147)
The petrography of the OPAP kimberlites, New Liskeard area, Ontario, Canada	Burgers, K.M., Boucher, D.R. and Kong, J.	in Addendum to extended abstracts, 7th International Kimberlite Conference, Cape Town, 1998 1998 (15166)
Ordivician and Silurian fossils and strata of the Lake Timiskaming outlier	Copper, P. and Armstrong, K.D.	Geological Association of Canada - Mineralogical Association of Canada, Joint Annual Meeting, GAC-MAC Sudbury 1999, Field Trip B2 Guidebook, 31p. 1999 (149040)
Volcanic stratigraphy of the late Archean Kidd-Munro assemblage in Dundonald and Munro townships and genesis of associated nickel and copper-zinc volcanogenic massive sulpfide deposits. Abitibi greenstone belt, Ontario, Canada	Davis, P.C.	unpublished M.Sc. Thesis, University of Alabama, Tuscaloosa, 201p. 1997 (120077)
On Archean granites, greenstones, cratons and tectonics: does evidence demand a verdict?	de Wit, M.J.	Precambrian Research, v.91, p.181-226 1998 (15162)
Ontario's industrial mineral industry: an overview	Gerow, M., Sangster, P. and Steele, K.	unknown 1999 (15134)
Electrochemical mass-transport in overburden: a new model to account for the formation of selective leach geochemical anomalies in glacial terrain	Hamilton, S.M.	Journal of Geochemical Exploration v.63, p.155-172 1998 (15139)
Archean magmatism and deformation were not products of plate tectonics	Hamilton, W.B.	Precambrian Research, v.91, p.143-179 1998 (15161)
Five-element (Ni-Co-As-Ag-Bi) veins	Kissin, S.A.	Geoscience Canada, v.19, p.113-124 (15171)
High resolution magnetic anomaly maps from ERLIS compliation: an example from Kirkland Lake	Manning, S. and Morris, W.	CIM Bulletin v.90, p.89-93 1997 (15158)
Till geochemical signatures associated with gold deposits in the Timmins-Matheson area, Western Abitibi Greenstone Belt, northeastern Ontario	McClenaghan, M.B.	Geological Survey of Canada, Open File 3707, 90p. 1999 (119083)
Mineralogy and geochemistry of the A4 kimberlite and associated glacial sediments, Kirkland Lake, Ontario	McClenaghan, M.B., Kjarsgaard, I.M., Kjarsgaard, B.A., Stirling, J.A.R., Pringle, G. and Berger, B.	Geological Survey of Canada Open File 3769, 161 p. 1999 (119081)
Mineralogy and geochemistry of the C14 kimberlite and associated glacial sediments, Kirkland Lake	McClenaghan, M.B., Kjarsgaard, I.M., Stirling, J.A.R., Pringle, G., Kjarsgaard, B.A. and Berger, B.	Geological Survey of Canada, Open File 3719, 147p. 1999 (119082)
Till geochemical and iniicator mineral methods in mineral exploration	McClenaghan, M.B., Thorleifson, L.H. and Dilabio, R.N.W.	in Proceedings of Exploration 97: Fourth Decennial International Conference on Mineral Exploration, 1997, p.233-248 1997 (15163)

Title	Author	Type and Year of Publication
Report of Activities 1998, Resident Geologist Program: Kirkland Lake-Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., Guindon, D.L. and Gosselin, S.D.M.	Ontario Geological Survey, Open File Report 5991, 74p. 1999 (105991)
Proterozoic zircon growth in Archean lower crustal xenoliths, southern Superior craton - a consequence of Matachewan ocean opening	Moser, D.E. and Heaman, L.M.	Contrib Mineral Petrol, v.128, p.164-175 1997 (15135)
Paleoproterozoic metamorphism at the base of the North American craton revealed through U-Pb zircon dating of granulite-facies xenoliths	Moser, D.E. and Heaman, L.M.	Abstracts of the Eighth International Conference on Geochronology, Cosmochronology and Isotope Geology, U.S. Geological Survey Circular 1107, p.228 1994 (15136)
A U-Pb zircon study of lower-crustal xenoliths from the Archean Superior Province: evidence for two anomalously "young" metamorphic events at 2.58 Ga and 2.49 Ga	Moser, D.E. and Heaman, L.M.	in Waterloo '94, Geological Association of Canada - Mineralogical Association of Canada Annual Meeting May 16-18, 1994 Waterloo Ontario, Program with Abstracts p.A79 1994 (15137)
The geology of zinc-rich sulphide mineralization in metasedimentary subprovinces: examples from the Pontaic and Quetico subprovinces, Northeastern Ontario	Parker, J,R.	Ontario Geological Survey, OFR 5996, 67p. 1999 (105996)
A preliminary geological model for syenite-associated disseminated gold deposits in the Abitibi belt, Ontario and Quebec	Robert, F.	in Current Research 1997-C, Geological Survey of Canada, Paper 1997-1C, p.201-210 1997 (15151)
The nature, origin and physiochemical controls of hydrothermal Mo-Bi minerlaization in the Cadillac deposit, Quebec, Canada	Taner, H., Williams-Jones, A.E. and Wood, S.A.	Mineralium Deposita, v.33, p.579-590 1997 (15140)
Disequilibrium textures in the Centre Hill Complex, Munro Township, Ontario	Theriault, R.	Unpublished M.Sc. Thesis, University of Ottawa, Ottawa, Ontario, 207p. 1992 (120076)
Precambrian geology, Sheraton Township	Vaillancourt, C.	Ontario Geological Survey, Preliminary Map P.3387, scale 1:20 000 1999 (403387)
Evolution and paleohydrology of glacial lakes Barlow and Ojibway	Veillette, J.J.	Quaternary Science Reviews, v.13, p.945-971 1994 (15149)
Timing and kinematics of post-Timiskaming deformation within the Larder Lake - Cadillac deformation zone, southwest Abitibi greenstone belt, Ontario	Wilkinson, L. Cruden, A.R. and Krough, T.E.	Can. J. Earth Sci., v.36, p.627-647 1999 (15127)
A 2.7 Ga depleted tholeiite suite: evidence of plume-arc interaction in the Abitibi Greenstone Belt, Canada	Wyman, D.A.	Precambrian Research v.97 p.27-42 1999 (15131)
Paeoclimatology and provenance of the glaciogenic Gowganda Formation (Paleoproterozoic), Ontario, Canada: a chemostratigraphic approach	Young, G.M. and Nesbitt, H.W.	GSA Buletin, v.111, p.264-274 1999 (15150)

Table 7. Mineral deposits not being mined in the Kirkland Lake Regional Resident Geologist's District in1999.

Abbreviations

AF.....Assessment Files
CMH.....Canadian Mines Handbook
GR.....Geological Report
MDC.....Mineral Deposit Circular
MDIR.....Mineral Deposit Inventory record
MLS.....Mining Lands, Sudbury
MR.....Mining Recorder
NM.....The Northern Miner
OFR.....Open File Report
PC.....Personal Communication

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
180 East (Lebel)	Au 32D04SW00339	327 273 t of 4.11 g/t Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited (50%) (CMH 1999-2000, p.348)	Queenston Mining Inc. Website January 26, 2000	Inactive
Ajax (Strathy)	Cu, Ni, Au, Ag, PGE 31M04SW00022	2 062 505 tons of 0.412% Cu, 0.257% Ni; veins can average	Northern Platinum Ltd. (55%) (CMH	CMH 1999-2000, p. 312	Inactive

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
		2.9% Ni, 4.0% Cu, 2 g/t Au, 3.4 g/t Pt	1999-2000, p. 312)		
Amalgamated Kirkland (Teck)	Au 42A01SE00151	1 802 727 t of 5.49 g/t Au	Franco-Nevada Mining Corporation Limited (15%) - Queenston Mining Inc. (15%) - Cyprus Canada Inc. (70%) (Press Release Dec.13, 1995)	Queenston Mining Inc. Website January 26, 2000	Inactive
Anoki (Gauthier)	Au 32D04SW00069	1 074 545 t of 4.11g/t Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited (50%) (CMH 1999-2000, p.348)	Queenston Mining Inc. Website January 26, 2000	Active
Argyll (Beatty)	Au 42A09SW00133	87 000 tonnes of 7.54 g/t Au	McWatters Mining Inc. (CMH 1999-2000, p.269)	CMH 1999-2000, p.269	Active
Armistice (McGarry)	Au 32D04SE00013	433 981 tons of 0.250 oz per ton Au	Armistice Resources Ltd. (75%) – Sheldon-Larder Mines Limited (25%) (CMH 1999-2000, p.42)	CMH 1999-2000, p.42	Active
Barber Larder (McGarry)	Au 32D04SE00043	60 000 tons of 0.16 oz per ton Au	NFX Gold Inc. (75%) - Gwen Resources Ltd. (25%) (CMH 1999-2000, p.295)	CMH 1990-91, p.338	Inactive
Blue Quartz (Beatty)	Au 42A09SW00130	109 000 tons of 0.484 oz per ton Au	Joutel Resources Ltd. (50%) - River Gold Mines Ltd. (50%) (CMH 1998-99, p.259)	NM, March 20, 1980	Inactive
Boston Creek (Pacaud)	Au 31M13NW00053	330 000 tonnes of 4.2 g/T Au	Atapa Minerals Limited (50%) - Teck Corporation (CMH 1998-99, p.52)	CMH 1998-99, p.52	Inactive
Buffonta (Garrison)	Au 32D05NW00009	400 000 tons of 0.15 oz per ton Au	Gwen Resources Ltd. (60%) - AJ Perron Gold Corporation (40%)(CMH 1996-97, p.26)	CMH 1997-98, p.221	Inactive
Cheminis (McVittie)	Au 32D04SE00019	2.9 million tons of 0.17 oz per ton Au	NFX Gold Inc. (75%) – Fort Knox Gold Resources Inc. (25%). (Fort Knox Gold Resources Inc. Annual Report 1999)	NFX Press Release October 20, 1999.	Active
Clenor (Strathy)	Au, Ag 31M04SW00088	24 000 tons of 0.21 oz per ton Au, 1.8 oz per ton Ag	Gwen Resources Ltd. (CMH 1997-98, p.220)	GR 163	Inactive
Commodore (Lebel)	Au NEW	738 000 tons of 0.07 oz per ton Au inferred with a higher grade zone of 307 000 tons of 0.11 oz Au per ton inferred	H.Egg, AF (Sudbury Contact Mines Limited)	AF	Inactive
Creek Zone (Hislop)	Au 42A08NW00142	1.1 million tons of 0.186 oz per ton Au	Stroud Resources Ltd. (CMH 1999-2000, p.393)	CMH 1999-2000, p.393	Inactive

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Diadem (Strathcona)	Cu, Ni 31M04SW00077	450 000 tons of 0.5% Cu, 0.1% Ni to 400 feet	Teck Corporation – Cominco Ltd.	MDIR N 0045	Inactive
Eastmaque (Teck)	Au 42A01NE00043	2 132 500 tons of tailings of 0.035 oz per ton Au	Hecla Mining Company (Eastmaque to Equinox Resources Ltd to Hecla in 1994) (CMH 1996-97, p.207-208)	CMH 1991-92, p.142	Inactive
Fenn-Gib (Guibord)	Au 42A09SE00054 42A09SE00187	1.95 million t of 5.13 g/t Au above 250 m level	Pangea Goldfields Inc. (70% Fenn, 100% Gib)(St Andrew Goldfields option to earn 50%)(CMH 1999-2000, p.329)	CMH 1999-2000, p.329	Active
Fort Knox (Fawcett, Ogilvie, North Williams)	Cu, Ni NEW	750 000 tons	Fort Knox Gold Resources Inc. – Inco Limited (CMH 1999-2000, p.171)	AF	Inactive
Garrcon (Garrison)	Au 32D12SW00004	350 900 tons of 0.191 oz per ton Au	Moneta Porcupine Mines Inc. (75%) – Jonpol Explorations Limited (25%)(OFR 5735, p.766, CMH 1998-99, p.317)	Jonpol Explorations Limited News Release, February 2, 1988	Active
Golden Harker (Harker)	Au 32D05NW00159	500 000 tons of 0.16 oz per ton Au	Golden Harker Explorations Limited (CMH 1999-2000, p.190)	NM, March 7, 1988	Inactive
Gordon Lake (Tyrrell)	Au 41P10NW00006	225 000 tons of 0.20 oz per ton Au to 750 feet	Duncan Gold Resources Inc. – Dalhousie Oil Company Ltd. (AF)	AF	Inactive
Hislop West (Hislop)	Au 42A09SW00033	19 230 tons of 0.59 oz per ton Au	Battle Mountain Gold Company (CMH 1997-98, p.67)	OFR 5735, p.1070	Inactive
Hydro Creek (Tyrrell)	Au 41P11NE00024	535 000 tons of 0.13 oz per ton Au resource	Orogrande Resources Inc. (Orogrande Resources Inc. Press Release May 7, 1998)	Orogrande Resources Inc. Press Release May 7, 1998	Active
Iris (Harker)	Au - W 32D05NW00021	769 756 tons of 0.07 oz per ton Au	The Alberta Gold Corporation (55%) - Perrex Resources Inc. (45%) (CMH 1995-96 p.289)	AF KL-3170	Inactive
Leckie (Strathy)	Au 31M04SW00090	405 000 tons of 0.2 oz per ton Au	Stroud Resources Ltd. (CMH 1999-2000, p.393)	CMH 1999-2000, p.393	Inactive
Ludgate (Michaud)	Au 42A08NE00159	462 000 tonnes of 5.91 g/t Au	Pentland Firth Ventures Ltd. (60%) – Coniagas Resources Limited (formerly QSR Limited) (40%) (CMH 1999-2000, p.333)	TNM February 1, 1999 p. 2.	Active
Macassa (Teck)	Au 42A01SE00020	791 943 tons of 0.48 once per ton Au	Kinross Gold Corporation (CMH 1999-2000, p.246)	OFR 5991	Inactive

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Martin-Bird (Hearst)	Au 32D04SE00143	558 000 tons of 0.114 ounce per ton Au	Barrick Gold Corporation (AF KL-3752)	AF KL-3752	Inactive
Matachewan (Powell)	Au 41P15NE00014 41P15NE00017	10 549 000 tons of 0.058 oz per ton Au	Royal Oak Mines Inc. Pricewaterhouse Coopers as receiver (CMH 1999-2000, p.364)	CMH 1998-99, p.398	Inactive
McBean (Gauthier)	Au 32D04SW00060	2 676 273 t of 6.17 g/t Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited (50%) (CMH 1999-2000, p.348)	Queenston Mining Inc. Website January 26, 2000	Active
Newfield (Garrison)	Au 32D12SW000042	450 000 tons of 0.28 oz per ton Au	Jonpol Explorations Limited (64.3%) – Aurado Exploration Ltd. (35.7%) (CMH 199-2000, p.240)	CMH 1996-97, p.243 and Jonpol Explorations Limited, Project Progress Report, April 10, 1997	Inactive
Omega (McVittie)	Au 32D04SE00017	300 000 tons of 0.16 oz per ton Au	Greater Lenora Resources Corp. (CMH 199-2000, p.200)	CMH 199-2000, p.200	Inactive
Ross (Hislop)	Au 42A08NW00005	1 055 000 tons of 0.125 oz per ton Au	Preston Electrical and Mechanical Ltd. (sold by Giant Yellowknife Mines Limited in 1989 CMH 1990-91, p.188)	CMH 1989-90, p.188	Inactive
Southwest Zone (Michaud)	Au 42A08NE00038	2.36 million tonnes of 6.07 g/t Au	Moneta Porcupine Mines Inc. (CMH 1999-2000, p.282)	CMH 1999-2000, p.282	Active
Taylor (Taylor)	Au 42A10SE00066 42A10SE00065 New	Shaft – 607 000 tons of 0.38 oz per ton Au Shoot – 949 000 tons of 0.15 oz per ton Au West Porphyry – 1 918 000 tons of 0.34 oz per ton Au	St Andrew Goldfields Ltd. (CMH 1999-2000, p.387)	CMH 1999-2000, p.387	Active
Teck Hughes (Teck)	Au 42A01NE00020	375 000 tons of 0.2 oz per ton Au	Kinross Gold Corporation - Newfields Minerals Inc. (PC, 1996)	CMH 1991-92, p.270	Inactive
Temagami Copper (Phyllis)	Cu, Ni 41116NE00004	770 000 tons of 1.04% Cu, 0.46% Ni	Teck Corp. – Cominco Ltd. (AF)	AF	Inactive
Tyranite (Tyrrell, Knight)	Au 41P11NE00013	567 000 tons of 0.18 oz per ton Au	Mill City Gold Mining Corp. – Tyranex Gold Inc. (CMH 199-2000, p.275)	NM 06/93	Active
Upper Beaver (Gauthier)	Au, Cu 32D04SW00068	180 000 t of 8.6 g/t Au, 1.2% Cu	Queenston Mining Inc. (Queenston Mining Inc. Press Release January 5, 2000)	Queenston Mining Inc. Press Release January 5, 2000	Inactive
Upper Canada	Au 32D04SW00057	1 903 455 t of 6.86 g/t Au	Queenston Mining Inc. (50%) - Franco-Nevada Mining Corporation Limited	Queenston Mining Inc. Website January 26, 2000	Inactive

Deposit Name (Township)	Commodity/ MDI No.	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
			(50%) (CMH 1999-200, p.348)		
Victoria Creek (Gauthier)	Au NEW	4 958 000 t of 3.43 g/t Au	Sudbury Contact Mines Limited (CMH 1998-99, p.429)	CMH 1998-99, p.429	Inactive

Table 8. Summary of Activities of the Kirkland Lake Regional Resident Geologist's Office - 1999.

Activity	Number
Office Visits	1871
Office Visits - Drill Core Library	19
Telephone Inquiries	1697
Properties Visited	49
Field Trips Attended	6
Field Trips Given	6
Talks Given	3
Assessment Files & Donations Processed	410
OPAP/Heritage Fund Reports Processed	5
Titles Added to Library Database	66
Drill Holes Added to Drill Core Library	2
MDI Records Updated	1077
MDI Records Deleted	2
MDI Records Added	1
MDI Records Deepened	11

Table 9. Gold production in the Kirkland Lake Regional Resident Geologist's District – 1999.

Mine	Township	Tons Milled	Production (oz.Au)	Grade (oz./T)	Years of Production
Aljo	Beatty	2,333	42	0.018	1940
American Eagle	Munro	60	40	0.667	1911
Argyll	Beatty	12,455	851	0.068	1918
Armistice	McGarry	8,282	1,035	0.125	1995, 97 (bulk samples)
Ashley	Bannockburn	157,076	50,123	0.319	1932-36
Barber Larder	McGarry	30,118	3,072	0.102	1988
Barry Hollinger	Pacuad	267,741	77,000	0.288	1918,25-36,44-46
Bidgood	Lebel	586,367	160,184	0.273	1934-51
Blue Quartz	Beatty	500	81	0.162	1923,26,28,34
Bourkes	Benoit	1,298	277	0.213	1918,36-38
Buffonta	Garrison	117,013	12,139	0.104	1981,91-92
Canadian Arrow	Hislop	279,593	17,045	0.061	1980-83
Canamax (Matheson Project)	Holloway	38,675	5,391	0.139	1988
Cathroy Larder (Mirado)	McElroy	89,719	10,231	0.114	1941-44,47,57,87
Centre Hill**	Munro	327,007	422	0.001	1967-70
Cheminis	McVittie	179,013	17,530	0.098	1991-96

Mine	Township	Tons Milled	Production (oz.Au)	Grade (oz./T)	Years of Production
Chesterville	McGarry	3,260,439	358,880	0.110	1930-52
Croesus	Munro	5,333	14,859	2.786	1915-18,23,31-36
Eastmaque (tailings)	Teck	1,051,744	28,740	0.027	1988-91
Ethel Copper**	James	17,477	115	0.007	1962-67
Gateford (Swastika)	Teck	103,684	30,068	0.290	1910-47***
Glimmer*	Hislop	840,606	151,203	0.180	1997-
Golden Summit	Maisonville	737	57	0.077	1936-37,45
Gold Hill	Catharine	4,616	660	0.143	1927-28
Gold Pyramid	Guibord	175	36	0.206	1911
Hislop Mine (Hislop East)*	Hislop	255,150	35,052	0.137	1990-91,93-95,99-
Holloway Mine*	Holloway	1,784,945	317,492	0.178	1993,95(preproduction),96-
Holt-McDermott*	Holloway	5,725,461	920,382	0.161	1988-
Hudson-Rand	Teck	6,496	483	0.074	1922
Kerr	McGarry	40,336,512	10,457,441	0.259	1911,38-96
Kirkland Lake	Teck	3,140,283	1,172,955	0.374	1916-60
Kirkland Townsite	Teck	4,230	1,921	0.454	1958-59
Laguerre	McVittie	40,514	7,568	0.187	1937-39
Lake Shore	Teck	17,208,323	8,602,791	0.500	1918-65,82-87,97-98
Macassa*	Teck	7,877,532	3,525,389	0.448	1933-99
Macassa (Tailings)*	Teck	3,117,181	163,761	0.053	1987-99
Matachewan Consolidated	Powell	3,525,200	378,101	0.107	1934-54
McBean	Gauthier	557,621	45,900	0.082	1984-86
Miller Independence	Pacaud	31	59	1.903	1918
Moffat-Hall	Lebel	16,388	4,780	0.292	1934-35
Morris Kirkland	Lebel	127,253	16,999	0.134	1936-38,40-42
New Telluride	Skead	104	62	0.596	1931-32
Newfield	Garrison	55,000	9,680	0.176	1996(bulk sample)
Omega	McVittie	1,615,081	214,098	0.133	1913,26-28,36-47
Queenston	Gauthier	1,054	177	0.168	1941
Ronda	Macmurchy	24,592	2,727	0.111	1939
Ross	Hislop	6,714,482	995,832	0.148	1936-89
Ryan Lake**	Powell	188,790	1,352	0.007	1948-57,62-64
Stairs	Midlothian	15,835	3,573	0.226	1965-66
Sylvanite	Teck	5,049,536	1,674,808	0.332	1927-61
Teck Hughes	Teck	9,565,302	3,709,007	0.388	1917-68
Toburn	Teck	1,186,316	570,659	0.481	1917-68***
Tyranite	Tyrrell	223,810	31,352	0.140	1939-42
Upper Beaver	Gauthier	580,562	140,709	0.242	1913-72***
Upper Canada	Gauthier	4,648,984	1,398,291	0.301	1938-71
White-Guyatt	Munro	50	10	0.200	1911
Wright Hargreaves	Teck	9,934,327	4,821,296	0.485	1921-65
Young Davidson	Powell	6,213,272	585,690	0.094	1934-57
Total including tailings		**137,122,278**	**40,750,478**	**0.297**	
Total excluding tailings		**132,953,353**	**40,557,977**	**0.305**	

Production by Gold Camp

Mine	Township	Tons Milled	Production (oz.Au)	Grade (oz./T)
Kirkland Lake Camp (West to East)				
Macassa*	Teck	7,877,532	3,525,389	0.448
Kirkland Lake	Teck	3,140,283	1,172,955	0.374
Teck Hughes	Teck	9,565,302	3,709,007	0.388
Lake Shore	Teck	17,208,323	8,602,791	0.500
Wright Hargreaves	Teck	9,934,327	4,821,296	0.485
Sylvanite	Teck	5,049,536	1,674,808	0.332
Toburn	Teck	1,186,316	570,659	0.481
Total		**53,961,619**	**24,076,905**	**0.446**
Kirkland Lake Tailings				
Eastmaque (tailings)	Teck	1,051,744	28,740	0.0273
Macassa (Tailings)*	Teck	3,117,181	163,761	0.0525
Total		**4,168,925**	**192,501**	**0.046**
Virginiatown Camp				
Chesterville	McGarry	3,260,439	358,880	0.1101
Kerr	McGarry	40,336,512	10,457,441	0.2593
Total		**43,596,951**	**10,816,321**	**0.248**
Holloway Camp				
Holloway Mine*	Holloway	1,784,945	317,492	0.178
Holt-McDermott*	Holloway	5,725,461	920,382	0.161
Total		**7,510,406**	**1,237,874**	**0.165**
Hislop Camp				
Glimmer*	Hislop	840,606	151,203	0.180
Hislop Mine (Hislop East)*	Hislop	255,150	35,052	0.137
Ross	Hislop	6,714,482	995,832	0.148
Total		**7,810,238**	**1,182,087**	**0.151**
Matachewan Camp				
Matachewan Consolidated	Powell	3,525,200	378,101	0.107
Young Davidson	Powell	6,213,272	585,690	0.094
Total		**9,738,472**	**963,791**	**0.099**

* *Producer in 1999*
** *Base Metal Production*
*** *Intermittent Production*

Table 10. Analyses of epidote-garnet altered mafic volcanic rock and equivalent unaltered mafic volcanic rock, Maisonville Township

	SiO_2	Al_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	TiO_2	Fe_2O_3	LOI
Units	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%
Detec. Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
99001	35.69	14.90	0.25	1.04	26.66	0.04	ND	0.07	0.74	17.02	2.69
99002	50.02	14.53	0.22	8.15	7.64	3.21	0.23	0.09	1.29	14.22	1.09

	Total	Ba	Be	Cd	Co	Cr	Cu	Li	Mo	Ni	S
Units	wt%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detec. Limit	N/A	3	3	2	5	4	5	3	8	5	30
99001	99.10	43	ND	33	19	149	18	ND	ND	44	1502
99002	100.69	75	ND	29	48	268	109	6	ND	121	669

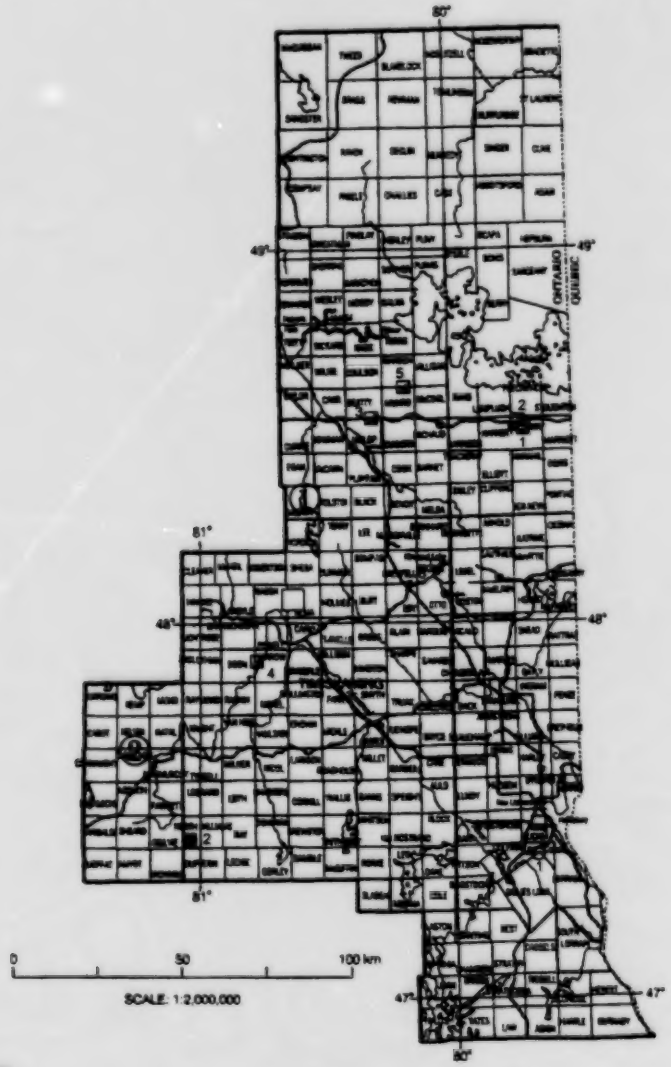
	Sc	V	Zn	W	La	Ce	Pr	Nd	Sm	Eu	Gd
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detec. Limit	1	5	2	40	0.01	0.01	0.01	0.01	0.01	0.01	0.01
99001	23	315	82	ND	4.68	10.83	1.85	7.81	2.61	1.14	2.92
99002	37	340	122	ND	5.32	13.55	2.34	10.41	3.45	1.06	4.01

	Tb	Dy	Ho	Er	Tm	Yb	Lu	Rb	Sr	Nb	Cs
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detec. Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01
99001	0.60	3.61	0.95	2.50	0.39	2.54	0.42	0.47	>3000	3.04	0.03
99002	0.84	4.80	1.29	3.24	0.54	3.19	0.54	8.85	169	4.42	0.73

	Hf	Ta	Th	U	Y	Zr	Au	Pt	Pd
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb
Detec. Limit	0.01	0.01	0.02	0.02	0.05	1	5	8	8
99001	1.25	0.18	0.28	0.34	24.65	29.37	ND	ND	ND
99002	1.16	0.26	0.40	0.10	30.61	26.97	5	ND	ND

99001 epidote-garnet altered mafic volcanic rock
99002 unaltered mafic volcanic rock

KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST'S DISTRICT

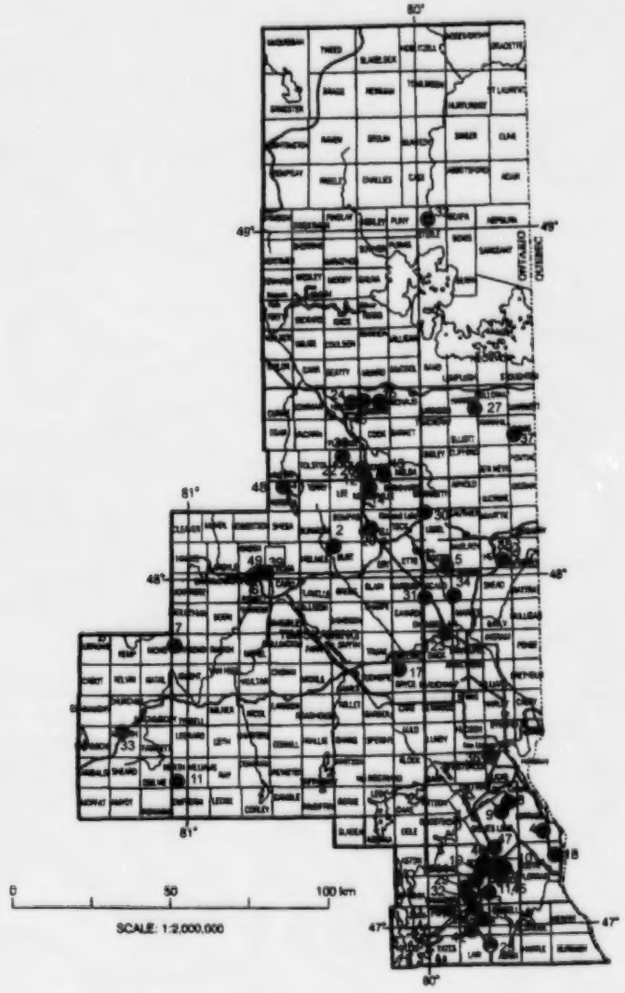


LEGEND

- Producing Mines
  1. Barrick Gold Corporation - Holt-McDermott Mine
  2. Battle Mountain Gold and Teddy Bear Valley Mines Limited - Holloway Mine
  3. Exall Resources Limited and Glimmer Resources Inc. - Glimmer Mine
  4. Extender Minerals of Canada Ltd. - Yarrow Mine
  5. Hedman Resources Ltd. - Hedman Mine
  6. Kinross Gold Corporation - Kirkland Lake Operation
- Advanced Exploration
  1. Extender Minerals of Canada Ltd. - North Williams Township
- Quarries
  1. Miller Minerals - Bucke Quarry
- Mills
  1. SMC (Canada) Ltd.
- (1) OGS Field Parties
  1. C. Vaillancourt
  2. G. Johns

Figure 1. Mining and exploration in the Kirkland Lake Regional Resident Geologist's District --1999

KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST'S DISTRICT



LEGEND

● Property Visit - see Table 5.

Figure 2. Property visits in the Kirkland Lake Regional Resident Geologist's District --1999

Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Kirkland Lake Regional Resident Geologist (Sudbury District)–1999

by

M. Cosec and E. C. Chaloux

2000

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KIRKLAND LAKE REGIONAL RESIDENT GEOLOGIST (SUDBURY DISTRICT)—1999

M. Cosec[1] and E. C. Chaloux[2]

[1]District Geologist, Sudbury District, Resident Geologist Program, Ontario Geological Survey

[2]District Support Geologist (Acting), Sudbury District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

The Sudbury District Geologist office of the Resident Geologist Program includes all the judicial districts of Sudbury, Manitoulin, Parry Sound, and Muskoka, and parts of Nipissing and Renfrew. It encompasses approximately 45 000 square km and over 340 townships (Figure 1).

The production of nickel, copper, and related by-products by Falconbridge Limited and Inco Limited dominate mining activities in the Sudbury District. Metal production was down somewhat from the previous year, despite a modest increase in metal prices toward the end of the year.

At the end of 1999, a total of 3094 mining claim units were recorded in the Sudbury Mining Division. This represents an increase of 24 % from the previous year. Cancellations fell by 35% from the previous year (Table 1).

Table 1. Summary of claims recorded and assessment work credits in the Sudbury District in 1999.

Year	Claims Units Recorded	Claim Units Cancelled	Claims Units Active	Diamond Drilling ($)	Physical Work ($)	Geotechnical* Work ($)	Total ($)
1999	3094	2469	15 215	NA	NA	NA	2 241 392
1998	2445	3815	13 056	NA	NA	NA	2 182 037
1997	3411	2648	11 257	NA	NA	NA	2 235 293
1996	2512	1548	7934	398 135	279 359	200 631	878 125
1995	3511	3027	6738	343 645	341 063	449 847	1 134 555

** As of 1992, Geological and Geophysical Survey data are combined as Geotechnical Work.*
NA - data not available.

Exploration expenditures in terms of assessment work submitted were $2 241 392 in 1999, an increase of 3% over the previous year.

Exploration activity by junior companies and individuals in platinum group elements (PGE) continued strong with the upturn experienced toward the end of 1998. This was precipitated primarily by a province-wide interest of PGE hosted in mafic intrusive rocks.

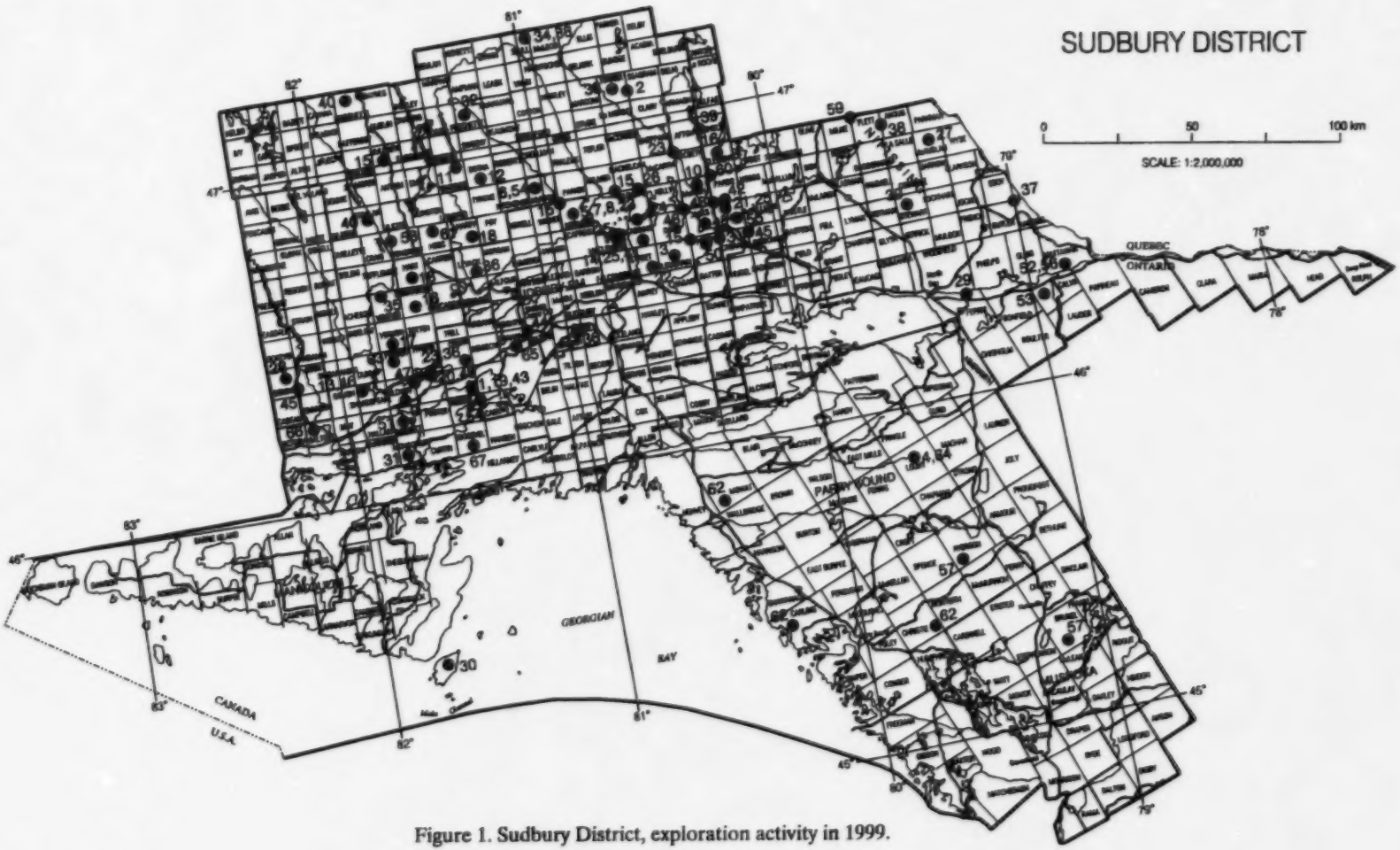


Figure 1. Sudbury District, exploration activity in 1999.

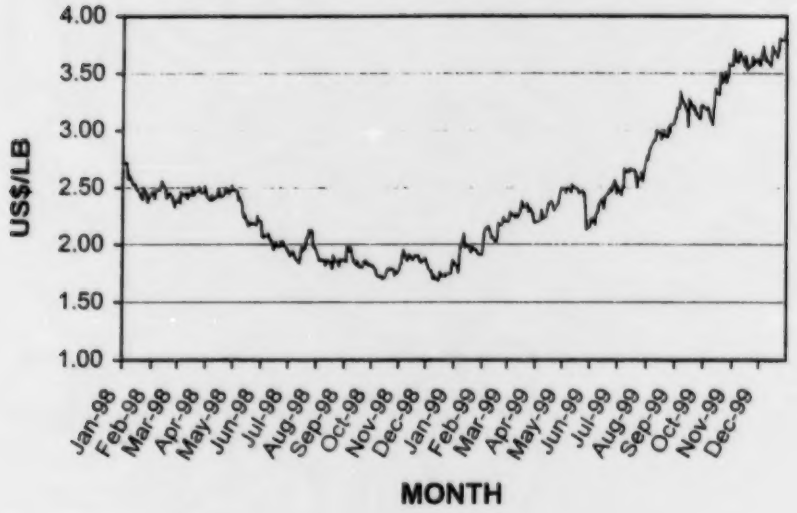


Fig 2a. Nickel prices for 1998-1999.

Fig 2b. Copper prices for 1998-1999.

MINING ACTIVITY

Nickel prices rebounded in 1999 after hovering around a twelve-year low in late 1998. The average London Metals Exchange (LME) price of nickel was US$2.73 per pound in 1999 compared with US$2.40 per pound in 1998, a 30% increase. The increase has been attributed in part to accelerated stainless steel production and a supply deficit resulting from production cuts and closures. At year-end, nickel had achieved a spot price of US$3.75 per pound (Figures 2a, 2b).

Industry analysts, however, remain cautiously optimistic of short-term prices with the deferral of the Inco Limited Voisey's Bay project being offset by new laterite mines and the evolution of pressure-leach extraction technology.

The average LME price of copper was US$0.71 per pound in 1999, compared with US$0.75 per pound in 1998, a decease of nearly 5%. Prices fluctuated around ten-year lows in the middle of the year.

Falconbridge Limited and Inco Limited operated 17 underground mines in the Sudbury district in 1999 (Table 2, Figure 3).

Falconbridge Limited

Falconbridge Limited reported consolidated earnings of $153.1 million in 1999, compared to a consolidated loss of $36.4 million for 1998. The company's average realized prices for nickel and copper in 1999 were US$2.78 per pound and US$0.74, respectively. This compares to average realized prices for nickel and copper in the previous year of US$2.23 per pound and US$0.77 per pound.

Mine production from the company's Sudbury Division in 1999 was 35 678 t nickel and 40 999 t copper, slightly down from the previous year due to lower ore grades and smelter furnace problems.

The production of PGE grew in importance during 1999 as production volumes expanded and prices rose significantly. Falconbridge Limited is now producing approximately 200 000 ounces of PGE annually (Falconbridge Limited press release, February 2, 2000).

All ore from the Sudbury Division is concentrated at the Strathcona Mill, which has a milling capacity of approximately 10 000 tons per day. Copper concentrate is trucked to the company's Kidd Metallurgical Division facilities in Timmins for smelting and refining. The nickel-copper concentrate from the Strathcona Mill is treated at the Sudbury Division's Falconbridge smelter along with custom feed from other sources. The Falconbridge smelter has the capacity to produce 90 000 tons of nickel matte per year. The matte is shipped to the Nikkelverk refinery in Norway for further processing.

The current workforce of the company is 1740. This is 100 less than the previous year and was achieved by attrition and layoffs. Further workforce reductions may be expected in 2000.

Inco Limited

Production from the company's Ontario Division in 1999 was 266 million pounds contained nickel and 265 contained copper from 9.5 million tons of ore hoisted, shipped, and received (B. Thompson, Inco Limited, personal communication, 2000). This compares to 282.9 million pounds contained nickel and 263 million pound contained copper in 1998.

The company operated 11 mines, 2 mills, 1 smelter, 4 refineries, 3 sulphuric acid plants, 1 liquid sulphur dioxide plant, and 1 oxygen plant, producing 10 commodities.

The closure or suspension of operations was announced at 6 mines, namely: Little Stobie in mid-1999, the Levack and McCreedy West in the third quarter of 1999, Frood No. 3 in late 1999, Crean Hill in 2000, and Coleman in 2001. The Levack headframe and hoistroom will remain intact and heated for possible future use as a tourist attraction (Inco Limited press release, July 5, 1999).

All ore from the Ontario Division is milled at the Clarabelle Mill, which has a rated capacity of 45 000 tons per day. The ore is upgraded from 1.2% Ni and 1.2% Cu to a combined total of 7% nickel-copper concentrate. The Copper Cliff Mill provides flotation facilities used to separate bulk nickel-copper concentrate produced by the mill and upgrades it to 20% combined nickel and copper. An additional precious metal and PGE refinery is located in Port Colborne, Ontario.

Industrial Minerals Production

Several industrial mineral commodities were produced throughout the district in 1999. These include dolostone, silica, trap rock, flagstone, and sundry varieties of coloured aggregates. Numerous companies throughout the Sudbury District extracted considerable amounts of sand and gravel for various purposes.

LAFARGE CANADA INCORPORATED

Lafarge Canada Incorporated quarried approximately 4 million tons of dolostone from its Meldrum Bay quarry on Manitoulin Island. Massive dolostones of the Amabel Formation are excavated in a single lift of approximately 50 feet. The material is classified as 70% construction aggregate and 30% metallurgical grade filler.

UNIMIN CANADA LIMITED

Unimin Canada Limited produced approximately 450 000 tons of high-grade silica from the Bar River Formation on Badgely Island. The coarse silica is shipped to Midland, Ontario and Ashtabula, Ohio for further processing.

ADVANCED EXPLORATION

Falconbridge Limited

Falconbridge Limited completed its pre-feasibility study of the Onaping Deep project in Levack Township and has progressed to the feasibility stage. Diamond drilling to date has indicated an undiluted mineral resource of 13.86 million tonnes of 2.91% nickel and 1.80% copper to 2600 m below surface. Production could begin as early as 2007. Underground diamond drilling also continued on delineating the Southeast Zone, located 400 m east of Onaping Depth Main Zone (*Canadian Mines Handbook, 1999-2000*; D. MacEachern, Falconbridge Limited, personal communication, 2000).

Table 2. Mine production and reserves in the Sudbury District in 1998 (keyed to Figure 3). Production figures for individual mine production in 1999 were unavailable at the time of writing.

Metal Mine Producers	Production in 1998	
	Tonnage @ Grade (tonnes)	Total Commodity (tonnes)
Falconbridge Ltd. (tons except when noted)	2 770 231 @1.67%Ni 1.81%Cu	46 167 Ni 50 191 Cu
	N/A	200 000 tons sulphuric acid
Strathcona Mine	436 736 @0.64%Ni 7.08%Cu	2 778 Ni 30 908 Cu
Fraser Mine	707 454 @1.58%Ni 0.69%Cu	11 211 Ni 4 912 Cu
Onaping/Craig Mine	1 151 075 @2.035Ni 0.80%Cu	23 365 Ni 9 261 Cu
Lockerby Mine	219 483 @2.33%Ni 0.88%Cu	5 119 Ni 1 931 Cu
Thayer Lindsley Mine	255 483 @1.45%Ni 1.24%Cu	3 694 Ni 3 179Cu
INCO Limited (tons except total Ni, Cu in lbs.)	10 600 000 @ 1.34Ni 1.25Cu	282 935 327 Ni 263 257 797 Cu
	N/A	599 594 sulphuric acid
Frood	590 862 @1.11 Ni 1.07Cu	13 116 695 Ni 12 697 319 Cu
Garson	619 056 @1.86 Ni 1.21Cu	13 116 695 Ni 12 697 319 Cu
Copper Cliff South	858 355 @1.50 Ni 1.94Cu	25 682 557 Ni 33 368 019 Cu
Little Stobie	614 618 @0.75 Ni 0.96Cu	9 214 697 Ni 11 780 891 Cu
Stobie	3 346 876 @0.82 Ni 0.77Cu	55 111 675 Ni 51 616 450 Cu
Copper Cliff North	779 945 @1.58Ni 1.47Cu	24 581 314 Ni 22 993 724 Cu
Lower Coleman	654 713 @1.54 Ni 0.89Cu	20 147 183 Ni 11 616 640 Cu

Table 2, cont'd.

Crean Hill	485 487 @1.59 Ni 1.31Cu	15 476 666 Ni 12 700 390 Cu
Creighton	1 175 953 @0.75 Ni 0.96Cu	49 275 122 Ni 34 542 904 Cu
McCreedy East	307 829 @1.61 Ni 0.58Cu	9 893 794 Ni 3 577 415 Cu
McCreedy West	775 115 @2.99 Ni 1.62Cu	25 093 488 Ni 46 417 953 Cu

Inco Limited

Inco Limited conducted underground exploration at most of its operations throughout the year.

Extensive underground diamond drilling was conducted at a new mineralized zone, discovered in 1997, 1.8 km north of the Copper Cliff South Mine in Snider Township. Over 1 km of drifting was completed on the 3320-foot level of the mine to provide access for exploration. Ongoing exploration from the drift discovered a small, high-grade zone of mineralization within a lower-grade halo, 400 m north of the shaft (*Canadian Mines Handbook, 1999-2000*).

EXPLORATION ACTIVITY

Exploration activity in the district increased moderately from the previous year, with many companies conducting multiple projects. The primary target was PGE mineralization in Paleoproterozoic mafic intrusive rocks. Exploration of, and for, Offset dikes of the Sudbury Igneous Complex was also prominent. Several small exploration programs for industrial-grade garnet continued from 1998. Refer to Table 4.

Twenty-two OPAP-funded projects were undertaken.

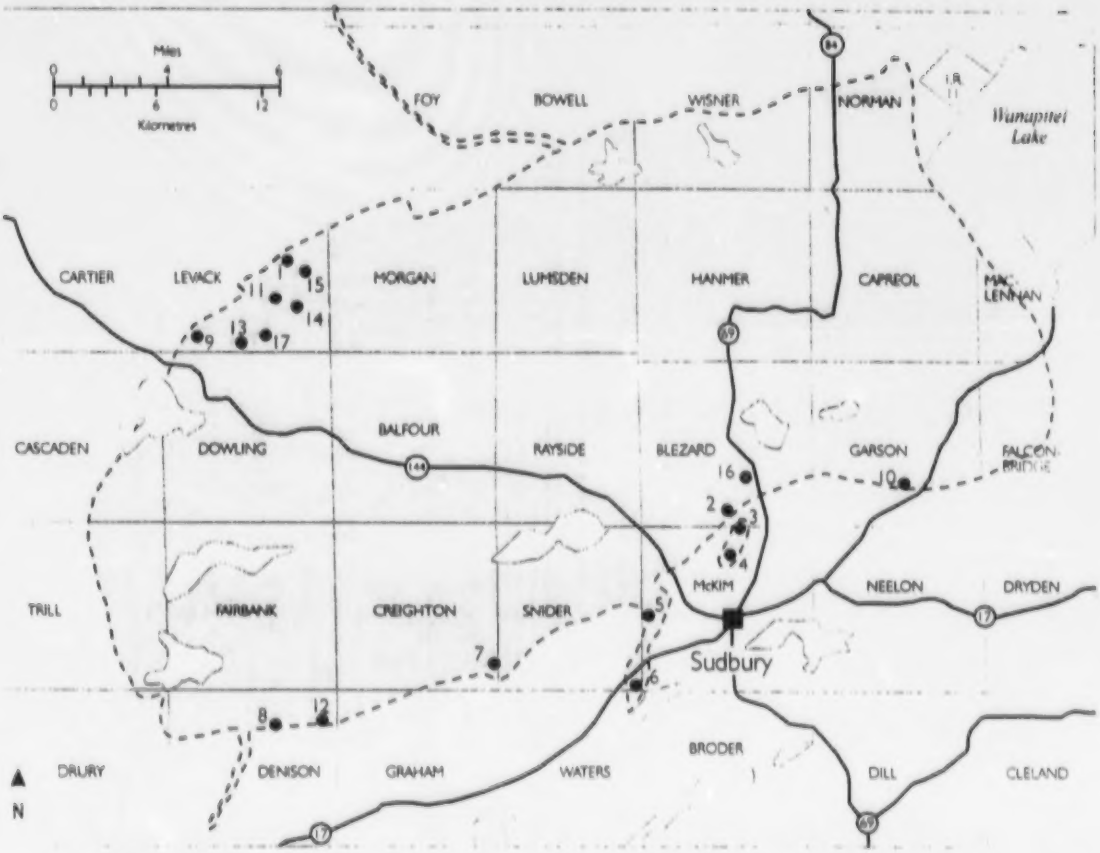
Programs of note are detailed below.

Aquiline Resources Incorporated

Aquiline Resources Incorporated entered into an agreement with Mustang Minerals Corporation in which it can earn up to a 70% interest in 96 claim units in the latter company's property underlain by the River Valley mafic intrusion in Dana, Janes, Henry, and Crerar townships. Later in the year, Aquiline Resources Incorporated also acquired an additional 136 claim units in adjacent Loughrin Township.

In April, Aquiline Resources Incorporated entered into option agreements with both Freewest Resources Canada Incorporated and Mustang Minerals Corporation to earn a 50% interest in 17 claim units in Gerow Township on ground underlain by the East Bull Lake differentiated mafic intrusion. The claims being optioned cover a PGE exploration target called the Parisien Lake Deformation Zone, identified by the Ontario Geological Survey in the early 1990's. Thirty per cent of samples collected by the OGS produced combined values greater than 2 g/t Pt+Pd+Au. (Aquiline Resources Incorporated press release, April 6, 1999).

Figure 3. Producing Mines in the Sudbury area, 1999 (keyed to Table 2).



Inco Limited

(Ni,Cu,Co,Au,Ag,PGM,Se,Te,SO_2,H_2SO_4)

1) Lower Coleman
2) Little Stobie*
3) Stobie
4) Frood
5) Copper Cliff North
6) Copper Cliff South
7) Creighton
8) Crean Hill
9) McCreedy West*
10) Garson
11) McCreedy East

Falconbridge Limited

(Ni,Cu,Co,Au,Ag,PGM,H_2S)

12) Lockerby
13) Onaping
14) Fraser
15) Strathcona
16) Thayer Lindsley
17) Craig

----- Outline of the base of the Sudbury Igneous Complex, showing some of the Offset Dikes

* *closed in 1999*

Table 3. Assessment files received in the Sudbury District in 1999.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarisation survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
OMIP ..... Ontario Mineral Incentive Program
OPAP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Antoine	Kyanite Mining Corporation	1998	Str, Tr, Samp	2.19016	SP004
Baldwin	Barton Bay Resources Inc.	1999	Lc, Pr, Samp	2.19506	SP012
Baldwin, Nairn	J.P. Owen	1999	Str, Samp	2.19502	SP013
Boon	Mustang Minerals Corp.	1999	Pr, GL, Samp	2.19648	SP012
Botha	D. Beilhartz	1999	DD, Lc, GM	2.19635	SP007
Brunel	R.V. Stewart	1999	GL	2.19486	SP003
Calvin	R. Rose	1999	Lc, GM	2.19267	SP002
Carling	J.R. Trussler	1999	GL	2.19675	SP012
Christie	J.R. Trussler	1999	GL	2.19677	SP003
Clement	M. Brenner	1998	Tr, Lc	2.18957	SP005
Clement	M. Brenner	1998	Tr, Lc	2.19003	SP004
Clement, Pardo	Triex (Tenajon) Res. et al.	1999	IP, VLFEM, GM	2.19202	SP006
Clement, Pardo, McNish	Triex (Tenajon) Res. et al.	1999	VLFEM, GM, GC	2.19198	SP007
Crerar	Mustang Minerals Corp.	1999	GL, Samp, GC	2.19557	SP005
Dana	Dana Black Granite Ltd.	1998	Lc	2.18905	SP002
Dana	Sharpmin Developments Inc.	1998	Tr	2.18958	SP003
Dana	Mustang Minerals Corp.	1999	GL, Samp, GC	2.19671	SP004

Table 3, cont'd.

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Dana, Pardo	L. Lutha	1999	Lc, Str, Tr, GL, Samp	2.19680	SP005
Dieppe, Truman	G. Salo	1998	Str, Tr, VLFEM, GM, Samp, GC	OP97-117	SP011*
Drury	Falconbridge Ltd.	1999	GM	2.19633	SP001
Ellis, McLoed	Lake Superior Resources Corp.	1999	GL, GC, VLFEM, AM	2.18991	SP002
Ferris	D. Fudge	1998	VLFEM	2.18962	0011-A1
Flett, Angus	Lake Superior Resources Corp.	1998	AM	2.18906	SP001
Flett, Angus	Lake Superior Resources Corp.	1998	GL,GC, Samp	2.18774	SP002
Flett, Hartle	Temex Resources Ltd.	1999	Samp, GC	2.19605	SP003
Gerow	Mustang Gold Corp.	1999	DD, Samp, GC	2.19491	SP008
Gerow	Mustang Gold Corp.	1999	Lc, IP, GM	2.19454	SP009
Graham	Wallbridge Mining Company Limited	1999	Samp	2.19856	SP002
Graham, Waters	Minescape Exploration Inc.	1999	GL	2.19628	SP001
Hart	Champion Bear Resources Ltd.	1998	GL	2.18946	SP009
Hart	Champion Bear Resources Ltd.	1999	DD	2.19242	SP010
Hart	Champion Bear Resources Ltd.	1999	DD	2.19591	SP011
Hart	Champion Bear Resources Ltd.	1999	DD	2.19883	SP012
Henry, Loughrin	J. Brady	1998	Str, Samp	2.19200	SP006
Hess	H. Tracanelli	1998	Tr, GL	2.18964	SP011
Hess	Champion Bear Resource Ltd.	1999	DD, GL	2.19907	SP014
Hess, Hart, Harty, Moncrieff	Champion Bear Resources Ltd.	1999	AM, VLFEM	2.19024	SP004
Hess, Moncreiff, Hart, Ermatinger	Champion Bear Resources Ltd.	1999	AEM, AM, VLFEM	2.19240	SP013
Hutton	G. Salo	1999	Samp	OP98-150	SP035*
Hutton	H.D. Barry	1998	Str, Tr, DD, Samp	2.19057	SP038
Hutton	G. Salo	1998	Samp	OP97-117	SP036*
Hyman, Nairn	Dan Patrie Exploration Ltd.	1999	Lc, GM, IP	2.19606	SP002
Janes	Goldwright Explorations Inc.	1998	DD, Str, Samp	2.18988	SP008
Janes	Goldwright Explorations Inc.	1999	DD, GL, GC	2.19887	SP012
Janes	J. Brady	1999	Tr	2.19161	SP010
Janes	F. Racicot	1999	Lc, Pr, GL, Samp	2.19618	SP011
Janes, Henry	F. Racicot	1998	Pr, Samp, GC	OP97-215	SP009*

Table 3, cont'd.

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Louise	1228328 Ontario Inc.	1999	Pr, Lc, Tr, GM, GL, Samp, GC	OP97-147	SP005*
Louise	1228328 Ontario Inc.	1999	DD, IP	2.19529	SP006
Louise	1228328 Ontario Inc.	1999	DD	2.19706	SP007
Lount	W.J. Vandevalk, H. Vandevalk	1999	Pr, GL, Samp, GC, GM	OP98-011	SP025*
Lount	R.E. Bain	1999	Lc, GL, Tr	2.19730	SP026
MacBeth	Falconbridge Ltd.	1999	GEM	2.19728	SP010
MacLennan	T. Fielding	1999	Pr, Str, Samp	2.19501	SP016
Mattawan	G. Shouinard	1999	Pr, Str, Samp, Lc, GL	2.19370	SP007
Mattawan	E.A. Rose	1998	GL, Str, Samp	OP97-019	SP008*
Mattawan	G. Shouinard, R. Montreuil	1999	GL, Pr	2.19369	SP009
McAuslan	Fluxor Inc.	1999	Lc, Pr, GL, GC, Samp	2.19647	SP004
McNish	P. Bassanese	1998	Pr, Str	2.19022	SP010
McNish	Flag Resources	1998	DD	2.19023	SP011
McWilliams	Mustang Minerals Corp.	1999	GL, Samp, GC	2.19682	SP001
Milne	Temex Resources Ltd.	1999	Samp, GC	2.19596	SP001
Moncreiff, Craig	R.J. Suomu	1999	VLEM, GL	2.19162	SP016
Mongowin	Garson Resources Ltd.	1999	DD, GL, GC	2.19243	SP016
Mowat	J.R. Trussler	1999	GL	2.19676	SP003
Muldrew	J. Brady	1999	Str, Tr, Samp	2.19160.	SP004
Norman	A. Barry	1998	Str, Tr, DD, Samp	2.19058	SP026
Norman	L. Barry	1999	Str, Tr	2.19371	SP027
Norman	A. Barry	1999	DD, Samp	2.19847	SP028
Norman	Barry, S.H.	1999	DD, Str, Tr, Samp, GC	2.19685	SP029
Papineau	High G Minerals Corporation	1999	Mineralogical study	2.19733	SP002
Pardo, McNish, Clement	Tenajon Resources Corp.	1999	Str, Tr, GC	2.19732	SP014
Parkin	J. Brady	1999	DD, GL	2.19244	SP059
Porter	M. Turcott, D. Brunne	1998	GL, Samp, GC	OP97-264	SP006*
Rathbun	Flag Resources	1999	DD	2.19238	SP029
Rathbun	Flag Resources (1985) Ltd.	1999	DD	2.19592	SP030
Rathbun	Flag Resources (1985) Ltd.	1999	DD	2.19683	SP032
Rathbun	Flag Resources (1985) Limited	1999	VLF, GM	2.19764	SP033

Table 3, cont'd.

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Rathbun	Flag Resources (1985) Limited	1999	PEM	2.1974	SP034
Hutton, Rathbun, Aylmer , Parkin, Norman	J. Brady, M. Brady	1998	Pr, Str, Tr, Samp, GC	OP97-101, OP97-102	SP037*
Rhodes	D.J. Beck	1999	Str, Tr, Pr	2.19678	SP014
Roosevelt	J.W. White	1999	Lc, GM	2.19455	SP009
Ryerson	R.V. Stewart	1999	GL	2.19268	SP001
Scadding	J. D. Bradley	1999	Pr, Samp, GC	OP97-220	SP033*
Scadding	M. Loney, T. Loney	1998	Pr, Str, DD, GL, Samp, GC	OP97-235, OP97-236	SP035*
Scadding	T. Loney (Klondike Bay Resources)	1999	Lc, VLFEM, GM, GL, Samp, GC	2.19741	SP036
Scadding, Dana	T. Fielding	1997	Pr, Beep, Str, Samp, GC	OP97-262	SP034*
Scadding, Rathbun	R. Fielding	1999	Pr, GC	2.19705	SP031
Scholes	Temex Resources Ltd.	1999	GL, Pr	2.19201	SP004
Scholes	Temex Resources Ltd.	1999	GL	2.19844	SP006
Scholes, Afton	Temex Resources Ltd.	1999	GL, Pr, Samp	2.19702	SP005
Shakespeare	P.G. Blue	1999	Pr, Samp	2.19528	SP005
Sheppard	Falconbridge Ltd.	1998	GM	2.18404	SP007
Stewart	R.L. Lashbrook	1999	Str, GL	2.19524	SP003
Stralak	A.J. Leclair	1999	Lc, GM	2.19368	SP002
Stull	A. Hill	1998	Str, Samp, GC, Pr	OP97-228	SP002*
Stull	A. Hill	1999	Pr, Str, Tr, Samp, GC	OP 98-368, OP 97-228	SP003*
Truman, Dieppe	G. Salo	1999	Pr, Str, Tr, Samp, VLFEM, GM	2.19236	SP010
Turner	Lake Superior Resources Corp.	1999	GL, GC, VLFEM, AM	2.18991	SP002
Turner/ Seagram	T. Anderson, T.J. Quesnel	1998	Pr, Tr, Samp, GC	OP97-181/182	SP001*
Venturi, Tofflemire	Ike Burns Exploration Corp.	1999	Pr	2.19566	SP002
West Ferris	D. Fudge	1999	Environmental assessment	2.19199	SP001
Widdifield	D. Fudge	1998	Str, Tr	2.18948	SP003

** OPAP funded*

Brady, J. /Brady, M.

J. and M. Brady continued with OPAP-funded exploration programs in Parkin and Norman Townships. At the Halcyon property, stripping, trenching, and lithogeochemical sampling returned anomalous gold values in mafic to intermediate Archean metavolcanic rocks. A sample from trench No.1 assayed up to 4.75 g/t gold over 0.05 m in a seam of pyrite and arsenopyrite. Carbonatization is prevalent throughout this area. At trench No. 19, a sample taken from a known nickel-copper occurrence at the contact of a gabbroic unit and Archean mafic metavolcanic rocks returned assay values of 8.78 g/t gold over 0.10 m. The area was the subject of diamond drill and bulk sampling program by Meridian Resources Incorporated from 1994 through 1997 (J. Brady 1999).

Champion Bear Resources Limited

Champion Bear Resources Limited conducted airborne geophysical surveys over, and adjacent to, the Iron Mask silver property in Hart, Harty, Hess, and Ermatinger townships. The property hosts three known copper-nickel-cobalt prospects and numerous silver-lead-zinc occurrences in a skarn-type environment. A total of 15 diamond drill holes were completed by Champion Bear Resources Incorporated on this project.

The company also completed two diamond drill holes on the Parkin (Whistle) Offset dike in Parkin Township, and five short diamond drill holes in an attempt to locate the extension of the concentric Hess Offset dike in the Hess Township area (S. Sears, consultant, personal communication, 2000).

Falconbridge Limited

Falconbridge Limited continued diamond drilling at its Norman West project, in the northeast corner of the Sudbury Igneous Complex. The company has established an inferred mineral resource of 7.6 million t grading 1.59% Ni and 1.28% Cu (*The Canadian Mines Handbook, 1999-2000*). The property is immediately west of the Inco Limited Whistle Mine property.

Diamond drilling was conducted at 9 other projects on the Sudbury Igneous Complex, primarily on North Range properties (MacEachern, D, Falconbridge Limited, personal communication, 2000). The company also continued with exploration on the Errington and Vermilion Cu-Pb-Zn-Ag properties in Fairbank and Creighton townships respectively. Those of note are described below.

In Bowell Township, shallow diamond drilling defined and inferred mineral resource of 678 000 t with an average grade of 1.58% Ni and 0.71% Cu.

At the Morgan-Fraser townships property, diamond drilling has defined and inferred mineral resource of 1.8 million t with and average grade of 1.73% Ni and 0.49% Cu.

Diamond drilling resumed at the Nickel Rim Depth Zone, the continuation of the Inco Limited Victor Deep orebody in Maclennan Township. Recent work has increased the inferred mineral resource to 1.6 million t with and average grade of 1.58% Ni and 10. 13% Cu along with elevated PGE values (*Canadian Mines Handbook 1999-2000*).

Flag Resources (1985) Limited/Golden Briar Mines Limited

Flag Resources Limited and Golden Briar Mines Limited commenced a diamond drilling program 400 m south from the Matagamasi Lake nickel-copper-PGE occurrence in Rathbun Township. The Matagamasi Lake occurrence and the Rathbun Lake nickel-copper-PGE occurrence, 3.2 km to the west, are located on the northern boundary of the "Wanapitei Gabbroic Intrusion". The Rathbun Lake occurrence is a small surface lens of massive sulphide

mineralization in gabbro. The companies may earn a 50% interest in the property by expending $400 000 over 4 years. (Flag Resources Limited press release, May 10, 1999).

One diamond drill hole, BL-99-01, reportedly intersected 340 m of finely disseminated nickel, copper, and PGE mineralization from 128 to 399 m below surface in Huronian Supergroup Gowganda Formation sedimentary rocks. Also, a ground magnetometer geophysical survey confirmed the presence of a 366 by 46 m anomaly, 1.6 kilometers south of the Matagamasi Lake occurrence.

Late in the year, diamond drilling commenced near the north contact of the Wanapitei Gabbro Intrusion with the Gowganda Formation. Three holes were completed for a total of 830 m. The drilling intersected core that appears to be somewhat differentiated, with a felsic phase above the contact containing finely disseminated pyrrhotite and pyrite.

Inco Limited

Inco Limited reported the discovery of a new high-grade zone of nickel-copper-PGE mineralization at the past-producing Totten Mine in Drury Township on the Worthington Offset dike. The discovery resulted from ongoing exploration the company is undertaking at its producing and past producing mines in the Sudbury area. The new zone has been intersected by six diamond drill holes, with grades varying from 0.9 to 3.3% Ni, 1.6 to 5.4% Cu and 6.3 to 8.7 g/t PGE over 6.3 to 35.6 m. The highest-grade intersection averaged 3.2% Ni, 3.6% Cu, and 5.7 g/t PGE over 16 m. Downhole geophysical surveys indicate continuity of the zone between drill holes and extensions of the mineralization to the south. Exploration will continue into 2000 in order to prove up a high-grade orebody that can be exploited at low cost, as the Totten Mine is currently on stand-by status (Moss, 2000). The mine operated from 1965 to 1970, producing 971 051 tons of ore.

Diamond drilling programs were also carried out near the Levack Mine in Levack Township, and at the recently discovered Kelly Lake deposit, 2 km south of the Copper Cliff South Mine in Broder Township.

Mustang Minerals Corporation

Mustang Minerals Corporation actively continued exploring for PGE mineralization at its East Bull Lake and River Valley properties during 1999.

In February, the company announced the completion of 8 diamond drill holes totaling 1200 m to evaluate the PGE potential of the Anorthosite Zone at the "Moon Lake Target Area" within the East Bull Lake Intrusion. The surface mineralization drilled corresponded to an induced polarization anomaly that extended for the entire 1500 m of the grid. Two of the holes were drilled in an area where grab samples assayed up to 5.93 g /t PGE and gold. The PGE mineralization had an average ratio of approximately 3:1 palladium to platinum and contained up to 0.07 g/t rhodium and up to 0.37 g/t gold. Copper and nickel values were present in all mineralized intersections up to a maximum of 0.41% Cu and up to 0.1% Ni. According to the company, the results of the drill program confirm the potential for continuous and significant PGE layers within the Anorthosite Zone along the margins of the intrusion (Mustang Minerals Corporation press release, February 11, 1999).

Mustang Minerals Corporation also acquired 2617 m of core from Atomic Energy of Canada Limited drilled at East Bull Lake in 1983. The four deep drill holes were part of a geotechnical program unrelated to mineral development and were not assayed for PGE. The company's assay results from drill hole AECL DDH-4 yielded values as high as 3.06 g/t PGE and gold over 2.15 m (Mustang Minerals Corporation press release, March 10, 1999).

Table 4. Exploration activity in the Sudbury District in 1999. (Keyed to Figure 1).

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
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DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GR ..... Geological survey
GM ..... Ground magnetic survey
GP ..... Geophysical survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarisation survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
OMIP ..... Ontario Mineral Incentive Program
OPAP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

No	Company/Individual or Property (Occurrence Name)	Township/Area (Commodity)	Exploration Activity
1	1228328 Ontario Inc. (Louie Lake Property)	Louise (PGE, Co, Cu, Ni, Ag, Au, Silica)	Pr, Lc, Tr, GM, GL, Samp, GC, DD, IP
2	Anderson, T. & T.J.Quesnel	Turner/ Seagram (Base metals)	Pr, Tr, Samp, GC
3	Aquiline Resources Incorporated	Loughrin (PGE)	GL, Tr, GM
3	Aquiline Resources Incorporated	Janes, Henry, Crerar, Dana (PGE)	Lc, Pr, GL, Samp, GC
4	Bain, R.E.	Lount (Garnet)	Lc, GL, Tr
5	Barry, A.	Norman (Ni, Cu, Au, Co)	Str, Tr, DD, Samp
6	Barry, H.D.	Hutton (Base metals, Au)	Str, Tr, DD, Samp
7	Barry, L.	Norman (Base metals)	Str, Tr
8	Barry, S.H.	Norman (Ni, Cu)	DD, Str, Tr, Samp, GC
9	Barton Bay Resources Inc.	Baldwin (Cu, Silica)	Lc, Pr, Samp
10	Bassanese, P.	McNish (Silica)	Pr, Str
11	Beck, D.J.	Rhodes (Ni, Cu, PGE)	Str, Tr, Pr
12	Beilhartz, D. (Venetian Lake Property)	Botha (Base metals)	DD, Lc, GM
13	Blue, P.G.	Shakespeare (Au)	Pr, Samp
14	Bradley, J.D.	Scadding (Au, Cu, Ni, PGE)	Pr, Samp, GC
15	Brady, J.	Henry, Loughrin, Janes (Dimension stone)	Str, Tr, Samp

Table 4, cont'd.

No	Company/Individual or Property (Occurrence Name)	Township/Area (Commodity)	Exploration Activity
15	Brady, J.	Muldrew (Base metals)	Str, Tr, Samp
15	Brady, J. and M. Brady	Hutton, Rathbun, Aylmer Parkin, Norman (Au, Ni, Cu, PGE)	Pr, Str, Tr, Samp, GC, DD, GL
16	Brenner, M.	Clement (Dimension stone, Silica)	Tr, Lc
17	Brunne, D. and H. Hapala	Vernon (Dimension stone)	GR
18	Champion Bear Resources Ltd.	Hart (Au, Ag, Co, Ni, Cu, Base metals)	DD, GL
18	Champion Bear Resources Ltd.	Hess, Hart, Harty, Moncrieff , Ermatinger (Ni, Cu, PGE, Au, Base metals)	AM, VLFEM, AEM, DD, GL
19	Club Resources Incorporated	Louise (Ni, Cu, PGE, Silica)	Samp, GC
20	Dan Patrie Exploration Ltd.	Hyman, Nairn (Ni, Cu, PGE)	Lc, GM, IP
21	Dana Black Granite Ltd.	Dana (Dimension stone)	Lc
22	Emerald Isle Resources Inc.	Street (Garnet)	DD
23	Falconbridge Ltd.	Norman, Drury (Ni, Cu, PGE)	DD, GM
23	Falconbridge Ltd.	MacBeth, Sheppard (Ni, Cu, PGE)	GEM, GM
24	Fielding, R. (Eagle Nest Claims)	Rathbun, Scadding (Cu, Au)	Pr, GC
25	Fielding, T.	MacLennan (Au)	Pr, Str, Samp
25	Fielding, T.	Scadding, Dana (PGE, Au)	Pr, Beep, Str, Samp, GC
26	Flag Resources (1985) Ltd./Golden Briar Mines Limited	Mackelcan, Rathbun (Ni, Cu, PGE)	DD, GC, GM, VLF, PEM
27	Fluxor Inc.	McAuslan (Silica, Industrial minerals)	Lc, Pr, GL, GC, Samp
28	Freewest Resources Canada Limited/ Sparton Resources Incorporated	Gerow (PGE)	DD, Samp, GC, GM
29	Fudge, D.	Ferris, Widdifield (Aggregate)	VLFEM, Str, Tr
30	Gardner, T.	Fitzwilliam Island (Industrial minerals)	GR
31	Garson Resources Ltd./ Datil Resources	Mongowin (Au)	DD, GL, GC
32	Glanfield, M.	Frechette (Cu, Au)	Pr, Str, Tr, Samp
33	Goldwright Explorations Inc.	Janes (Ni, Cu, PGE, Au, Ag)	DD, Str, Samp, GL, GC
34	Hill, A.	Stull (Au, Ag, Barite)	Str, Samp, GC, Pr, Tr
35	Ike Burns Exploration Corp. (Spanish River Carbonatite Complex)	Venturi, Tofflemire (Vermiculite, P)	Pr
36	Inco Limited	Levack, Drury, Broder (Ni, Cu, PGE)	DD, GC, GL
37	Kyanite Mining Corporation	Butler, Eddy, Antoine (Kyanite)	Str, Tr, Samp

Table 4, cont'd.

No	Company/Individual or Property (Occurrence Name)	Township/Area (Commodity)	Exploration Activity
38	Lake Superior Resources Corp.	Ellis, McLoed, Turner (U, Th)	GL, GC, VLFEM, AM
38	Lake Superior Resources Corp.	Flett, Angus (Dimension stone, Sulphides)	GL,GC, Samp, AM
39	Lashbrook, R.L.	Stewart (Dimension stone)	Str, GL
40	LeClair, A.J. and LeClair, R.	Stralak, Marquette (Au, Cu, Co, Ni, PGE, Dimension Stone)	Lc, GM, Pr
41	Loney, M. and T. Loney	Scadding (Au, Ni, Cu)	Pr, Str, Lc, DD, GL, Samp, GC, VLFEM, GM
42	Lutha, L. (River Valley Property)	Dana, Pardo (PGE)	Lc, Str, Tr, GL, Samp
43	Marl Resources Corp./ Pelangio-Larder Mines Ltd. / Golden Blade Resources/ Club Resources Inc. (Louie Lake Property)	Louise (PGE, Silica)	DD, GC
44	Minescape Exploration Inc.	Graham, Waters (Ni, Cu, PGE)	GL
45	Mustang Minerals Corp. (East Bull Lake PGM Property)	Gerow, Boon (Ni, Cu, PGE)	Pr, GL, Samp, GC, Lc, GM, IP, DD
45	Mustang Minerals Corp. (River Valley Property)	Crerar, Dana, McWilliams (PGE)	GL, Samp, GC
46	New Millenium Metals Corporation (Agnew Lake Pt-Pd Property)	Gough, Shakespeare (PGE)	Tr, GL, Samp, GC, DD
47	Owen, J.P.	Baldwin, Nairn (Dimension stone, Aggregate)	Str, Samp
48	Pacific North West Capital Corporation	Janes, Kelly, Davis, McNish, Dana, Pardo (PGE)	Str, Tr, Samp, GC
48	Pacific North West Capital Corporation/ Kaymin Resources Limited (River Valley area)	Janes, Kelly, Davis, McNish, Dana, Pardo (PGE)	GL, DD, GC, GM, IP
48	Pacific North West Capital Corporation/ Consolidated Venturex Holdings Limited	Davis, Kelly (PGE)	GL, GC, DD
49	Patrie, D.	Nairn, Hyman (Cu)	Pr
50	Racicot, F. (Sargesson Lake Property)	Janes (Ni, Cu, PGE)	Lc, Pr, GL, Samp
50	Racicot, F.	Janes, Henry (Dimension stone)	Pr, Samp, GC
51	Rintila, R. and L. Hautemaki	Merritt (Silica)	Pr
52	Rose, E.A.	Mattawan (K-spar)	GL, Str, Samp
53	Rose, R.	Calvin (Base metals, Au)	Lc, GM
54	Salo, G.	Dieppe, Truman (Ni, Cu, Au)	Pr, Str, Tr, VLFEM, GM, Samp, GC
54	Salo, G.	Hutton (Au)	Samp

Table 4, cont'd.

No	Company/Individual or Property (Occurrence Name)	Township/Area (Commodity)	Exploration Activity
55	Sharpmin Developments Inc.	Dana (Ni, Cu)	Tr
56	Shouinard, G.	Mattawan (Garnet)	Pr, Str, Samp, Lc, GL
57	Stewart, R.V.	Brunel, Ryerson (Flagstone)	GL
58	Suomo, R.J. (Benny Project)	Moncreiff, Craig (Base metals, Au)	VLEM, GL
59	Temex Resources Ltd.	Flett, Hartle, Milne (Diamonds)	Samp, GC
59	Temex Resources Ltd. (Eagle Rock Lake Property)	Scholes, Afton (Base metals, Au)	GL, Pr, Samp
60	Tenajon Resources Corp./ Triex Resources Ltd.	Pardo, McNish, Clement (Au)	Str, Tr, GC, IP, VLFEM, GM
61	Tracanelli, H.	Hess (Limestone, Marble)	Tr, GL
62	Trussler, J.R.	Carling, Christie, Mowat (Dimension stone)	GL
63	Turcott, M. & D. Brunne (Big Swan Project)	Porter (PGE, Au)	GL, Samp, GC
64	Vandervalk, W.J. and H. Vandervalk (Magnetawan Project)	Lount (Ni, Cu, Co)	Pr, GL, Samp, GC, GM
65	Wallbridge Mining Company Limited	Graham (Ni, Cu, PGE)	Samp
66	Ward, C.	Salter (Silica)	Str, Tr, Samp, GC
67	White, J.W. (Hanwood Lake Gold Project)	Roosevelt (Au)	Lc, GM

In May, it was announced that the mineralized layer of the intrusion had now been drill-confirmed along strike for 2.5 km. The AECL holes confirmed the zone of mineralization to a depth of over 700 m, approximately 2000 m down-dip from surface (Mustang Minerals Corporation press release, May 28, 1999).

Geological mapping, sampling, and an induced polarity survey at the East Bull Lake "Bullfrog Zone" outlined an 800 m long mineralized zone along the contact which contained elevated PGE values. Of 24 grab samples taken in the mineralized portion of the Bullfrog Zone, 12 samples returned values greater than 3 g/t PGE and gold. The highest recorded sample value was 9 g/t PGE and gold (Mustang Minerals Corporation press release, October 28, 1999).

In the last quarter of 1999, Impala Platinum Holdings Limited and Mustang Minerals Corporation announced the formation of the "Mustang-Implats River Valley Joint Venture". An agreement was finalized under which Impala Platinum Holdings Limited can earn a 60% interest in the River Valley PGE property by spending $6 million on the property over 5 years and making cash payments of $255 000 over 4 years (Mustang Minerals Corporation press release, December 14, 1999).

Pacific North West Capital Corporation

(The following is an invited submission by L. S. Jobin-Bevans, JB Exploration & Development Incorporated, Sudbury, Ontario, consulting geologist for Pacific North West Capital Corporation. All reported samples were collected and analyzed on behalf of Pacific North West Capital Corporation. It has been edited for brevity.)

INTRODUCTION

Geologically, the Sudbury area is best known for its rich nickel-copper-PGE deposits associated with the Sudbury Igneous Complex (SIC). However, over the past 2 years mineral exploration outside of the SIC for these commodities has rapidly increased after nearly 10 years of inactivity. In 1997, Goldwright Explorations Incorporated began exploring for nickel-copper-PGE deposits in Nipissing diabase located approximately 50 km northeast of Sudbury. Nipissing diabase is a 2.2 Ga suite of sills, dikes, and cone sheets that encompass over 25% of the Southern Structural Province. Indications of surface PGE enrichment on the Janes Township (continuous surface sample: 4.36 g/t PGE, 1.04% Cu and 0.42% Ni over 13.34 m) and Kelly Township (grab sample: 5.1 g/t PGE) properties led to an option agreement with Pacific North West Capital Corporation. Subsequent exploration activities resulted in a rush of staking to secure a great number of potential Nipissing diabase targets. In early 1999, junior exploration company Consolidated Venturex Holdings Limited entered into a joint-venture with Pacific North West Capital Corporation to explore for nickel-copper-PGE on the Davis-Kelly and Sargesson Lake properties located within the same general area as the Janes and Kelly properties. Several diamond drilling programs have been completed on Nipissing diabase targets including the Janes property (3.1 g/t PGE, 1.1% Cu and 0.3% Ni over 15.0 m), Davis-Kelly (3.9 g/t PGE, 0.44% Cu and 0.30% Ni over 4.4 m), and Sargesson Lake (1.34 g/t PGE, 0.19% Cu and 0.13% Ni over 1.2 m) prospects. In addition to Nipissing diabase targets, Pacific North West Capital Corporation is exploring for nickel copper-PGE on its River Valley option agreement located about 60 km northeast of Sudbury. The 4400 ha property overlies the northern half of the River Valley intrusion (2.5 Ga layered mafic intrusion, East Bull Lake suite) where initial grab samples assayed up to 12.6 g/t PGE. In 1999, PFN entered into a multi-million dollar financing deal with Anglo American Platinum Corporation Limited of South Africa.

TERMINOLOGY

Innes and Colvine (1979), recognizing a distinct distribution of metals in the area between Sault Ste. Marie and Cobalt, promoted the idea of an early Proterozoic metallogenic province. Various terms including Huronian-Nipissing Magmatic Belt (Peck et al. 1995) and Nipissing Magmatic Province (Lightfoot and Naldrett 1996) superseded this idea. The former term was introduced to describe an extensive early Proterozoic magmatic province inclusive of Matachewan dike swarm, East Bull Lake suite of intrusions, Huronian volcanic rocks and Nipissing diabase. These intrusions were formed during the initial stages of Huronian Supergroup rifting and within the basin-fill sediments (e.g. Vogel, James, and Keays 1998). On the basis of the area's geological timing with major Huronian Supergroup events and in order to formally recognize the unusually high concentrations of nickel-copper-PGE in the rocks in this area of the Southern Structural Province, it is proposed that the term "Huronian Metallogenic Province" be adopted. Geographically, this term encompasses the same general area as the Huronian-Nipissing Magmatic Province but is more specific in that it describes the area in terms of a metallotect.

MINERALIZATION

The 2.45 Ga East Bull Lake suite intrusions (East Bull Lake, Shakespeare-Dunlop, River Valley) and the 2.2 Ga Nipissing diabase suite are most prospective for magmatic nickel-copper-PGE sulphide deposits (Peck et al. 1995; Jobin-Bevans et al. 1998). The style of mineralization recorded in these intrusive suites is distinct from more widely known styles of PGE deposits (i.e. reef or massive sulphide) and is referred to as contact-type PGE deposits. As the name suggests these deposits are principally defined by their proximity to margin or footwall contacts. Other defining characteristics include: (1) very high PGE-tenor in both sulphide-bearing and barren/non-mineralized rocks; (2) high palladium and copper concentrations (approximately 3:1 Pd:Pt and 3:1 Cu:Ni ratios) in finely

disseminated, net-textured and bleb magmatic sulphide; (3) non-regularly layered and massive anorthositic, gabbroic and pyroxenitic host rocks; (4) prevalent magmatic breccia zone(s); and, (5) high background PGE content in feeder dikes, unmineralized cumulate rocks, and in possible feeder dikes that cross-cut the intrusions. Total sulphide contents in the PGE-rich rocks range from 1 to 10% and thus far there is no apparent correlation between total sulphide content and variations in PGE content. Specific examples of the contact-type PGE deposit are discussed below. It should be noted that although the contact-style of PGE mineralization does occur in the East Bull Lake and Nipissing diabase suites, it does not preclude these rocks from hosting the more typical reef or massive sulphide-style of PGE deposits.

JANES PROPERTY

To date, the best example of contact-type PGE mineralization in Nipissing diabase comes from the Janes property. Located north-centrally within this claim group, the JR prospect consists of a series of trenches and stripped areas that intermittently expose sulphide mineralization over a northeast-trending (030°) strike length of 500 m. Contact-related disseminated (2 to 10% total sulphide) to semi-massive (>25% total sulphide) sulphide mineralization occurs within the lower parts of the stratigraphic succession and is generally within 30 m of the footwall contact. This type of mineralization has thus far only been recognized at the Janes Township property (Chiniguchi River Intrusion) where it is generally confined to the lower 10 to 30 m of hypersthene-bearing gabbro and gabbronorite units. Sulphide mineralization is both net-textured and blebby and consists of chalcopyrite > pyrrhotite > pentlandite. Surface exposures of semi-massive mineralization occur as small (<1.0 m diameter) pods rich in chalcopyrite, pyrrhotite, and pentlandite. Distribution of these pods may be in part structural, whereby disseminated sulphides have become concentrated along localized fractures and/or faults and/or joint planes. Sulphide breccia, consisting of fragments of sedimentary rocks and gabbroic rocks cemented by a mixture of fine-grained carbonate and chalcopyrite, have been noted in several drill intersections.

Exposed surface widths of sulphide mineralization range from 1 to 22 m and are widest at Trench No.1, which is centrally located in the 500 m long mineralized zone. In general, sulphide mineralization (cp:po:pn = 4:2:1) ranges from 1 to 10% total sulphide and is hosted by a medium-grained, massive, hypersthene-bearing gabbro. The hypersthene-bearing gabbro unit is in gradational contact with a gabbro unit to the east and is within about 145 m down-dip of the footwall gabbro-sedimentary rock contact to the west. At surface, the footwall contact of the gabbroic body dips at approximately 30 to 45° southeast, and shallows to approximately 25° down-dip of the surface showings. Results from the surface sampling program are provided in Table 5. Trench 10, is located approximately 230 m south of Trench 1 and Trench 4 is located approximately 200 m northeast of Trench 1.

Table 5. Selected assay results from surface sampling program, Janes property.

Location	Interval(m)	Pd(g/t)	Pt(g/t)	Au(g/t)	*PGM(g/t)	*PGM(oz/t)	Cu (%)	Ni (%)
Trench 1	13.34	3.52	0.44	0.40	4.36	0.13	1.04	0.42
including	5.80	--	--	--	5.08	0.15	--	--
Trench 10	4.87	1.07	0.19	0.18	1.44	0.04	0.33	0.10
Trench 4 (**sample A)	2.74	2.92	0.62	0.18	3.72	0.11	0.51	0.36
Trench 4 (**sample B)	4.97	3.42	0.73	0.27	4.42	0.13	0.55	0.24
Trench 4 (sample C)	0.53	31.20	17.20	1.30	49.70	1.45	3.41	0.40
Trench 4 (sample D)	2.80	13.40	6.20	2.20	21.80	0.64	0.61	0.24
including	0.80	61.5	18.9	3.2	83.60	2.44	1.63	0.08
including	0.40	78.4	18.5	5.5	102.40	2.99	--	--
Trench 4 (sample E)	2.63	--	--	--	5.20	0.15	--	--

**PGM = platinum + palladium + gold; **sample B located about 3.25 m northeast and parallel to sample A*

Samples C, D, and E (Table 5.) were taken across a northeast trending gabbro-sedimentary rock unit contact that is exposed in Trench 4.

On the basis of the encouraging values from the surface-sampling program, a diamond drilling program was completed on the Janes property in April 1999; a second drilling program was completed in October 1999. The drilling programs were designed to test the down-dip extension and strike continuity of the approximately 500 m long surface zone of nickel-copper-PGE sulphide mineralization. The April 1999 drilling program was guided in part by the results of the surface sampling program and a 6-level induced polarization survey which defined a significant chargeability anomaly from surface to depth and coincident with the strike and dip of known surface mineralization. A total of 13 drill holes (NQ size) were completed, totalling 1041 m. Selected assay results from diamond drill core are listed in Table 6.

Table 6. Selected assay results from diamond drilling program, Janes property.

Drill Hole (strike/dip/depth)	Location	From m	To m	Intersection m	*PGM g/t	*PGM oz/t	Cu %	Ni %
JR99-01 (300°/-46°/68m)	50m east of Trench 1	35.00	50.05	15.05	3.10	0.09	1.08	0.27
including	--	--	--	4.64	3.93	0.11	1.68	0.26
JR99-11 (300°/-70°/60m)	same collar as JR99-01	32.52	48.68	16.16	2.15	0.06	0.64	0.27
including	--	--	--	5.67	3.07	0.09	0.70	0.31
JR99-06 (300°/-45°/47m)	30m south & 10m east of Trench 1	9.90	23.91	14.01	2.07	0.06	0.84	0.35
including	--	--	--	2.40	4.45	0.13	0.87	0.47
JR99-02 (340°/-52°/24m)	0.5 m northwest of channel sample C	7.78	11.00	3.22	2.49	0.07	1.34	0.65
including	--	--	--	0.64	5.25	0.15	3.37	1.67
JR99-03 (0°/-90°/14m)	10m north of JR99-02	0.00	8.68	8.68	4.45	0.13	0.69	0.44
Including	--	--	--	3.06	9.03	0.26	1.20	0.91
JR99-08 (340°/60°/44m)	30m south of JR99-03	35.83	37.37	1.55	6.71	0.20	0.35	1.10

DAVIS-KELLY PROPERTY

The Davis-Kelly property is approximately 70 km by road northeast of Sudbury. The property is being explored in a joint venture with Consolidated Venturex Holdings Limited. This property has the potential to host economic accumulations of PGE and gold in association with disseminated to blebby nickel-copper sulphides. A Phase I diamond drilling program, completed in October totalled 312 m in 5 holes and was designed to test the down-dip extent of known surface sulphide mineralization. Results are shown in Table 7.

SARGESSON LAKE

The Sargesson Lake property is located approximately 86 km by road northeast of Sudbury. The current exploration program is also a joint venture with Consolidated Venturex Holdings Limited. The property has economic potential similar to the Davis-Kelly property and results from October diamond drilling are presented in Table 8.

RIVER VALLEY PROPERTY

The Pacific North West Capital Corporation property, underlain by the River Valley mafic intrusive complex, is situated within Dana and Pardo townships, approximately 100 km by road northeast from Sudbury. The property includes two main areas of known mineralization, the Dana Lake area in the northwest quadrant of Dana Township

and the Azen Creek area, located 6 km to the southeast. Independent prospecting in late 1998 discovered mineralization in these areas. Over 5 months in 1999, Pacific North West Capital Corporation completed over 15 000 m^2 of stripping, detailed sampling, and ground magnetometer and induced polarization surveys. These surveys indicate that mineralization extends to minimum depths of 75 to100 m in some areas. The average from 419 grab samples is 452 ppb Pt+Pd+Rh+Au, 524 ppm Cu and 204 ppm Ni.

Table 7. Summary of assay results from diamond drilling program, Davis-Kelly property.

DDH	From (m)	To (m)	Interval (m)	*PGM (g/t)	%Cu	%Ni	Cu+Ni (%)
DK99-01	20.00	29.50	9.50	0.55	0.04	0.03	0.07
	51.20	54.53	3.33	2.66	0.31	0.19	0.50
DK99-02	16.00	20.50	4.50	0.55	0.04	0.03	0.07
	26.25	31.00	4.75	1.26	0.09	0.06	0.15
including	28.50	30.00	1.50	2.46	0.18	0.11	0.29
	49.10	53.50	4.40	3.93	0.44	0.30	0.74
including	49.10	52.70	3.60	4.38	0.49	0.33	0.82
DK99-03	18.20	19.70	1.50	0.99	0.21	0.08	0.29
	31.85	35.60	3.75	1.25	0.12	0.08	0.20
DK99-05	28.00	37.30	9.30	0.16	0.03	0.03	0.06
	40.40	41.70	1.70	0.46	0.06	0.05	0.11

**PGM = Pt+Pd+Au*

Table 8. Summary of assay results from property diamond drilling program, Sargesson Lake property.

DDH	From (m)	To (m)	Interval (m)	*PGM (g/t)	%Cu	%Ni	Cu+Ni (%)
SL99-01	15.10	17.00	1.90	0.37	0.34	0.12	0.46
	30.00	31.20	1.20	1.34	0.19	0.13	0.32
SL99-02	25.00	28.70	3.70	0.41	0.31	0.11	0.42
	31.25	39.30	8.05	0.33	0.26	0.09	0.35
	41.45	44.00	2.55	0.66	0.21	0.13	0.34
SL99-03	23.00	26.55	3.55	0.31	0.05	0.03	0.08
SL99-04	8.00	9.50	1.50	0.30	0.03	0.02	0.05
	48.60	51.50	2.90	0.71	0.10	0.06	0.16
SL99-05	13.50	21.00	7.50	0.58	0.33	0.14	0.47
including	14.00	17.50	3.50	0.71	0.43	0.18	0.61
	22.65	25.95	3.30	0.41	0.18	0.08	0.26
SL99-06	36.95	37.15	0.20	0.45	0.14	0.11	0.25
	44.30	55.25	10.95	0.74	0.47	0.21	0.68
including	45.00	53.00	8.00	0.88	0.61	0.26	0.87
	56.00	58.47	2.47	0.27	0.02	0.06	0.08

**PGM = Pt+Pd+Au*

The Dana Lake Area includes 5 mineralized zones, namely the Road Zone (RZ), the North Zone (NZ-I, II and III), the Central Zone (CZ), the Trench Zone (TZ), and the South Zone (SZ). Each of these areas was stripped and 1636 surface samples were collected using a regularly spaced 2.5 m by 2.5 m grid (Table 9). Stripping all 5 of these zones exposed extremely heterolithic magmatic breccia that appears to be subparallel and proximal to (1 to 75 m) or at the

margin of the intrusion. Angular fragments, ranging from several centimetres to greater than 1m, include anorthositic to pyroxenitic compositions, and can comprise up to 80% of any given area of outcrop. Layering is poorly developed proximal to the margins but appears to improve inward toward the core of the intrusion. Sulphide mineralization consists primarily of disseminated and blebby chalcopyrite with subordinate pyrrhotite, pentlandite, and pyrite and occurs mainly in the host matrix, although it is noted in many of the fragments themselves. Total sulphide content generally averages 1-3%, but as yet there is no immediate correlation between sulphide tenor and PGE concentrations.

Table 9. Selected assay results from surface sampling, Dana Lake and Azen Creek zones.

Zone	*n*	Au (ppb)	Pt (ppb)	Pd (ppb)	Rh (ppb)	Cu (ppm)	Ni (ppm)	3E[1] (ppb)	Pt+Pd+Rh (ppb)	4E[2] (ppb)	Pd:Pt	Cu:Ni	4E (opt)
RZ	445	53	236	628	28	715	274	917	878	931	2.0	2.2	0.027
RZE	93	29	122	362	--	538	233	513	484	513	2.5	2.4	0.015
NZ-1	71	10	26	44	2	245	170	81	72	82	1.5	1.5	0.002
NZ-2	41	61	325	962	35	1194	354	1348	1321	1382	2.6	3.4	0.040
NZ-3	90	40	176	527	--	789	287	743	714	754	2.3	2.5	0.022
CZ	165	70	350	1004	--	856	302	1425	1355	1425	2.5	2.5	0.042
TZ	99	52	275	810	31	793	280	1137	1116	1168	2.5	2.5	0.034
SZ	632	45	219	689	--	713	256	953	927	972	2.2	2.3	0.028
AZ	303	18	75	234	--	458	368	327	309	327	2.5	0.9	0.010

[1]3E = Pt+Pd+Au; [2]4E = Pt+Pd+Rh+Au; Rh assays were not available (--) for all samples at the time of writing

Azen Creek Zone (AZ) was stripped and 303 surface samples were collected (Table 9). This zone is inward approximately 200 m from the marginal contact of the intrusion and appears to represent a different mineralized environment than at Dana Lake. Stripping exposed several lithological units that include fine- to medium-grained troctolite, coarse-grained to pegmatitic gabbro, and medium-grained gabbronorite. Irregular and scoured contacts were noted between the fine- to medium-grained troctolite and the coarse-grained gabbroic unit, along with resorbed fragments of fine- to medium-grained troctolite within the coarse-grained gabbro. These observations suggest that the younger course-grained gabbroic unit was emplaced following crystallization of the finer-grained troctolitic unit. Unlike the Dana Lake area, sulphide mineralization is dominated by blebs of chalcopyrite with subordinate pyrrhotite and pentlandite. Finely disseminated chalcopyrite occurs throughout all of the rock units but is generally difficult to discern with the naked eye. Total sulphide contents generally average 1 to 2%, but as yet there is no immediate correlation between sulphide tenor and PGM concentrations.

SUMMARY

As significant components of the Huronian Metallogenic Province, the Nipissing diabase, and East Bull Lake suite of intrusions represent excellent targets for potentially economic PGE deposits. One of the mineralization styles recorded in these intrusive suites is distinct from the more widely known reef or massive-sulphide associated PGE deposit types and is referred to as a contact-type PGE deposit. This mineralization style is new in terms of classic PGE deposits and much is yet to be learned about its petrogenesis and economic potential. Currently, we can make several presumptions about these deposit types: (1) they are a product of a mafic (basaltic), low titanium, PGE-rich parental magmas that did not require interaction with an external source of sulphur in order to reach sulphur-saturation, (2) PGE and sulphide concentrations are proportional to the degree of magma convection and initial background PGE concentrations and in this case magmas were emplaced in a highly turbulent regime, (3) visible sulphide contents observed in hand specimen and the rock type itself do not necessarily reflect the actual PGE tenor of the rock, (4) nickel/copper and palladium/platinum ratios are about 2.5:1 to 3:1 which is to be expected in mafic

rocks (5) high PGE concentration in suspected feeder dikes such as the Hearst-Matachewan dike swarm rocks in the River Valley (53-818 ppb Pt+Pd+Rh+Au) and East Bull Lake intrusions.

In the year 2000, a $1 million exploration program, funded by Anglo American Platinum Corporation Limited will be conducted on the Pacific North West Capital Corporation River Valley and Nipissing diabase targets. Most of this funding will be used to expand geophysical surveys, stripping and prospecting programs and to provide at least 4000 m of diamond drilling.

Wallbridge Mining Company Limited

This privately funded local exploration venture continued exploration from the previous year on three properties associated with the Sudbury Structure. Two of these properties are on a feature known as the "Sudbury Breccia Belt" that may represent a favourable environment for the emplacement of Sudbury-type ore deposits.

At the Frood-Stobie Northeast property, located 1.5 km northeast of the Inco Limited Frood Stobie Complex, the company conducted detailed geological mapping, an audio magnetotelluric ground survey, followed by a four-hole diamond drilling program. In 1998, geological mapping by the company lead to the discovery of a previously unknown copper occurrence that returned assay values of 4.5% Cu, 0.56% Ni, and 2 g/t PGE. The new discovery is hosted within metamorphosed Sudbury breccia containing lenses of quartz diorite. The setting of this is similar to that of a footwall - hangingwall traverse through the Frood-Stobie orebody (Wallbridge Mining Company Limited 1998).

Exploration at the Creighton South property in Graham Township also consisted of detailed geological mapping and a ground audio magnetotelluric survey. This area is underlain by a previously unrecognized zone of melt rocks similar to those found at the margins of Offset dikes. It has been suggested this may represent a faulted extension of the Creighton Mine (W.V. Peredery, Wallbridge Mining Company Limited, personal communication, 1999).

Another ground audio magnetotelluric survey was conducted on the Trill property in Trill Township. Sudbury Igneous Complex rocks of the Trill Embayment that hosts the Trillabelle deposit underlie these claims. This area has been poorly explored due to spare outcrop exposure (M. Hall, Wallbridge Mining Company Limited, personal communication, 1999).

LAND USE PLANNING ACTIVITY

Land use planning activity this year consisted mainly of client consultations regarding the Ministry of Natural Resources Ontario's Living Legacy Initiative (formerly Lands for Life). Ontario's Living Legacy maps indicating proposed Provincial Park and Conservation site boundaries are available to the public for viewing at the District Geologist office. Mineral Resources assessments for previously selected sites are also available for viewing by the public.

Unrelated land use planning information was provided to Ministry of Natural Resources staff regarding land withdrawals and exchanges to three sites near Wanapitei Lake. Future access considerations to the Mackelcan Road were discussed on two field trips and in membership participation to the Sudbury District office of the Ministry of Natural Resources Local Citizens Committee.

A Ministry of Municipal Affairs and Housing seminar was attended to explain the resources available in the Resident Geologist Program. Information was also provided to consultants regarding Official Plans for the newly created Nairn-Hyman Municipal Township and Mattawan Municipal Township.

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

In 1999 the Sudbury District Geologist office was staffed M. Cosec, District Geologist; S. Gosselin, District Support Geologist; D. Stephenson, Acting District Support Geologist, and E.C. Chaloux, Acting District Support Geologist. During the summer, Experience students L. Knoll and P. Marion assisted the office.

Staff members attended the Prospectors and Developers annual meeting in Toronto, as well as local meetings of the Sudbury Prospectors and Developers Association, the Sudbury Geological Discussion Group, the Association of Mining Municipalities of Ontario, and the Greater Sudbury Chamber of Commerce.

Staff responded to approximately 2200 office inquiries and 2000 telephone inquiries. Requests for information included geological information on a host of topics, including exploration techniques, rock and mineral identification, mineral collecting, grant programs, staking and exploration activities in the district, geological tours, mineral potential evaluations, land use issues, and land value questions.

M. Cosec

The District Geologist served as the mining industry representative to the Northern Economic Development Area Team. Several clients were familiarized with potential funding available through the Northern Ontario Heritage Fund Corporation. The annual Regional Economic Development Conference in Sault Ste. Marie was attended.

M. Cosec continues to serve on the board of directors to the Association of Geoscientists of Ontario and chairman of the local association sub-committee. The Association of Geoscientists of Ontario is working for the professional registration of geoscientists in Ontario. In February, a well-attended information session and short course was organized with Dr. W. Pearson, board chairman, as guest speaker. Thanks are due to the Sudbury Geological Discussion Group and the Ministry of Northern Development and Mines for sponsoring the event.

M. Cosec is an industry advisor to the Sudbury District office of the Ministry of Natural Resources Local Citizens Committee. This committee provides recommendations to local land use planning decisions.

The Northeast Regional Geoscience Symposium in Timmins was attended in April, as was the annual Resident Geologist Program meeting in Red Lake in September.

A new field trip guide of the Sudbury Structure was completed for the Geological Association of Canada - Mineralogical Association of Canada joint annual meeting held at Laurentian University, and the meeting was attended.

Field trips of the Sudbury Structure and office tours were provided to various groups and individuals throughout the year. These included the University of Kentucky, Yellowknife College, University of Geneva, The Bishop Strachan School, Upper Canada College, Haileybury School of Mines, and local and out-of-town ministry personnel.

In November, M. Cosec was invited to be a member of the Science North Dynamic Earth geoscience committee. The goal of this committee is to provide planning input to a new, multi-million dollar mining and minerals education centre being developed at the Big Nickel site.

S. Gosselin

The District Support Geologist was enrolled in part-time studies in courses in geomorphology and history in the spring semester at Laurentian University.

S. Gosselin was on the Mining Week planning committee and participated in Mining Week activities throughout May, including an underground tour of the Sudbury Neutrino Observatory at the Inco Limited Creighton Mine.

S. Gosselin accepted a training and development position with the Ministry of Northern Development and Mines in Red Lake in July.

D. Stephenson

D. Stephenson, acting in a backfill position for the District Support Geologist, provided client services and office administration. She was effective in reorganizing the aerial photograph library and map filing systems in order to make them more client-friendly. Advice was provided on several land use planning issues, particularly the Mackelcan Road closure proposal. She was employed in the office from July to October, when she accepted a position with the Ministry of Northern Development and Mines Publication Services Section.

E. C. Chaloux

E. C. Chaloux also acted in a backfill position for the District Support Geologist succeeding D. Stephenson. He provided client service advise, administration, and conducted property visits. Mr. Chaloux is a recent B.Sc. (Hons.) geology graduate of Laurentian University.

Mineral Deposit Inventory

The Mineral Deposit Inventory is a digital catalog of mineral occurrences maintained by each district, as part of an ongoing project of the Resident Geologist Program. Files are continually being verified and expanded. New occurrences are also added to the database. All existing files in the following townships were verified for accuracy this year: Afton, Allan, Assignack, Attlee, Awrey, Aylmer, Badgerow, Baldwin, Balfour, Bears Back Island, Beaumont, Belfast, Beresford, Beulah, Bidwell, Bigwood, Blezard, Boon, Botha, Bowell, Broder, Burwash, Cadeau, Caen, Campbell, Capreol, Carlyle, Carnarvon, Cartier, Cascaden, Casimir, Cherriman, Clary, Cleland, Clement, Cockburn Island, Cosby, Cotton, Cox, Craig, and Creelman. Thanks are owed to S. Beauchamp of the Timmins Regional Resident Geologist office for her work on this project.

Table 10. Property visits conducted by the Sudbury District office in 1999 (keyed to Figure 4).

Number (keyed to Figure 4)	Property/Occurrence
1	Mantha property, Widdifield Township (stone)
2	Norman Township (Ni, Cu)
3	Parkin Township (various)
4	Stringer property, Maclennan Township (Au, silica)*
5	Bain property, Lount Township (garnet)
6	Vanderwalk property, Lount Township (Ni, Cu, PGE)
7	Flag (1985) Resources Limited, Rathbun Township (Au, PGE)*

Table 10, cont'd.

8	Pacific North West Capital Corporation, Dana Township (PGE)*
9	Club Resources Incorporated, Louise Township (Ni, Cu, PGE, Si)
10	D. Patrie property, Nairn and Hyman townships (Ni, Cu, PGE)
11	Sheguiandah Quarry, Manitoulin Island (silica)*
12	V. Boulard property, Cotton Township (PGE)
13	Gaudette property, Mattawan Township (silica, feldspar)

**Properties visited more than once.*

PROPERTY EXAMINATIONS

Bain Property

The Bain garnet property is located in Lount Township, Southern Ontario Mining Division, on 5 claim units in the vicinity of Lots 23, 24, 25, and 124; Concessions II and III (UTM 605000E/5069000N). Access to the property is gained by driving from downtown Huntsville, north via Muskoka Road No. 3 and then Highway No. 11, 58 km to Highway No. 124, then west on Highway 124 for 20 km to the Nipissing Road. Turn north on the Nipissing Road for 11.5 km via the west fork on the road that provides access to the Lake of Many Islands.

R.E. Bain of Huntsville acquired this property approximately 3 years ago on the advice of the former owner and some reconnaissance prospecting. There is evidence of previous work in the area in the form of several pits and trenches, some of which are over 1 m in depth.

The area is located within the Parry Sound Domain of the Central Gneiss Belt of the Grenville Structural Province. It was last mapped by J. Satterly, Ontario Department of Mines in 1953 and is described in O.D.M. Volume LXIV, Part 6, 1955. It is underlain primarily by amphibolite-biotite paragneiss. In the vicinity of the claim group, there are bands and pods of crystalline limestone that may be up to 1 km in width. Both gneiss and limestone units have in turn been intruded by biotite-rich granite. The intrusion of the granite has lead to the development of skarn-type mineral occurrences throughout the area.

Mineralization observed in old trenches includes coarse calcite, graphite, molybdenum, magnetite, and garnet. Garnet is by far the most common mineral within the skarn zones. In one trench on claim 1229907, a sample of medium-grained, medium-weight black crystalline rock was analyzed and confirmed to be 98% spessartine and grossular garnet (Ontario Geoscience Laboratories, 1998).

Recent logging in the area has exposed outcrops north of the access road through the claim group that are composed of up 80 to 90% fine- to medium-grained almandine garnet. The garnet content of outcrops observed on the property approaches approximately 90%. Gangue minerals include calcite, quartz, epidote, magnetite, and possibly ilmenite. Tightly folded granitic bands cut the garnet-rich zones. The rock units appear to be steeply dipping with variable easterly trends.

Although Satterly (1955) states that few Grenville Structural Province gneisses have been found to meet the commercial specifications for abrasive garnet, the new outcrop exposures, with higher garnet concentrations make this property a worthwhile prospect. Detailed geological mapping in the area is warranted, possibly followed by diamond drilling and bulk sampling.

During the property visit, a hitherto unknown nickel-copper-bearing mafic intrusion was located approximately 1km west of the Bain property. A trench in the sulphide-bearing rock, roughly 3 m deep by 5 m wide by 5 m long contained massive to disseminated chalcopyrite and pyrrhotite. Outcrop exposure in this area is poor and the full extent of this unit remains unknown. Assay results for PGE are pending. Messrs. Vanderwalk also conducted exploration for PGE on another mafic intrusive south of Fowke (Spring) Lake in the same vicinity. Little is known of this unit, although Satterly (1955) also notes 4 other mafic intrusions.

Boulard Property

V. Boulard, a local prospector, has staked one claim in a previously unmapped intrusive mafic body in northern Cotton Township. Access to the claim is by travelling northwest on Regional Road 84 from Capreol, then north approximately 56 km on Portelance Road to a clear cut.

Timber harvesting of the area has yielded several outcrops of what appears to be a previously unmapped mafic intrusion. The mafic body may be related to the Nipissing diabase (gabbro) previously mapped in northwestern Cotton Township. Continuity between outcrops was difficult to assess due to poor outcrop exposure. A weak, east-trending mineral fabric was observed in some outcrops, it is premature to deem this body layered. The size of the intrusion is undetermined at this time. Outcrops of the same gabbro were observed approximately 1 km east of the Boulard claim.

The majority of the outcrops observed are dark green, fine- to medium-grained gabbro. Hornblende usually comprises 50 to 60% of the rock, whereas plagioclase and biotite make up 40% and 10% respectively. There are some exposures of medium- to coarse-grained gabbro composed almost entirely of hornblende and biotite. No sulphides were observed and contact relationship between the gabbro and surrounding granitic rocks is unclear.

Lack of homogeneity, the presence of coarse-grained quartz-feldspar veins, and abundance of biotite does not make this rock a suitable candidate for dimensional stone. A study on the areal extent, contact relationships, and geology of the body should be carried out in this area to determine the economic potential, particularly in light of the recent interest in PGE exploration. This should be done while access to the site is still possible by truck as the access road is rapidly deteriorating and may be of no use within the next several years.

Assay results on a grab sample yielded the following values (Ontario Geoscience Laboratories, 1999).

Ag	1.4 ppm	Au	<5 ppb
Cu	29 ppm	Pt	<15 ppb
Ni	232 ppm	Pd	<10 ppb

Although these results are not very encouraging, one must keep in mind that to assess the economic potential of what may be a fair-sized intrusion, a more systematic mapping and sampling program is required.

Gaudette Property

A discovery of quartz-feldspar pegmatite was made in 1993 by M. Gaudette of Sudbury. The property is located on Lot 34, Concession V, Mattawan Township. It is reached by travelling north from the Mattawa River bridge in the town of Mattawa, northeast on Highway No. 533 for a distance of approximately 5 km to Burk's Road, then east on Burk's Road for approximately 0.5 km. The occurrence is located south of the road, on a hill at the end of a trail behind a residence owned by M. Gaudette (UTM 672300E/5135000N) The property is mining and surface rights patented.

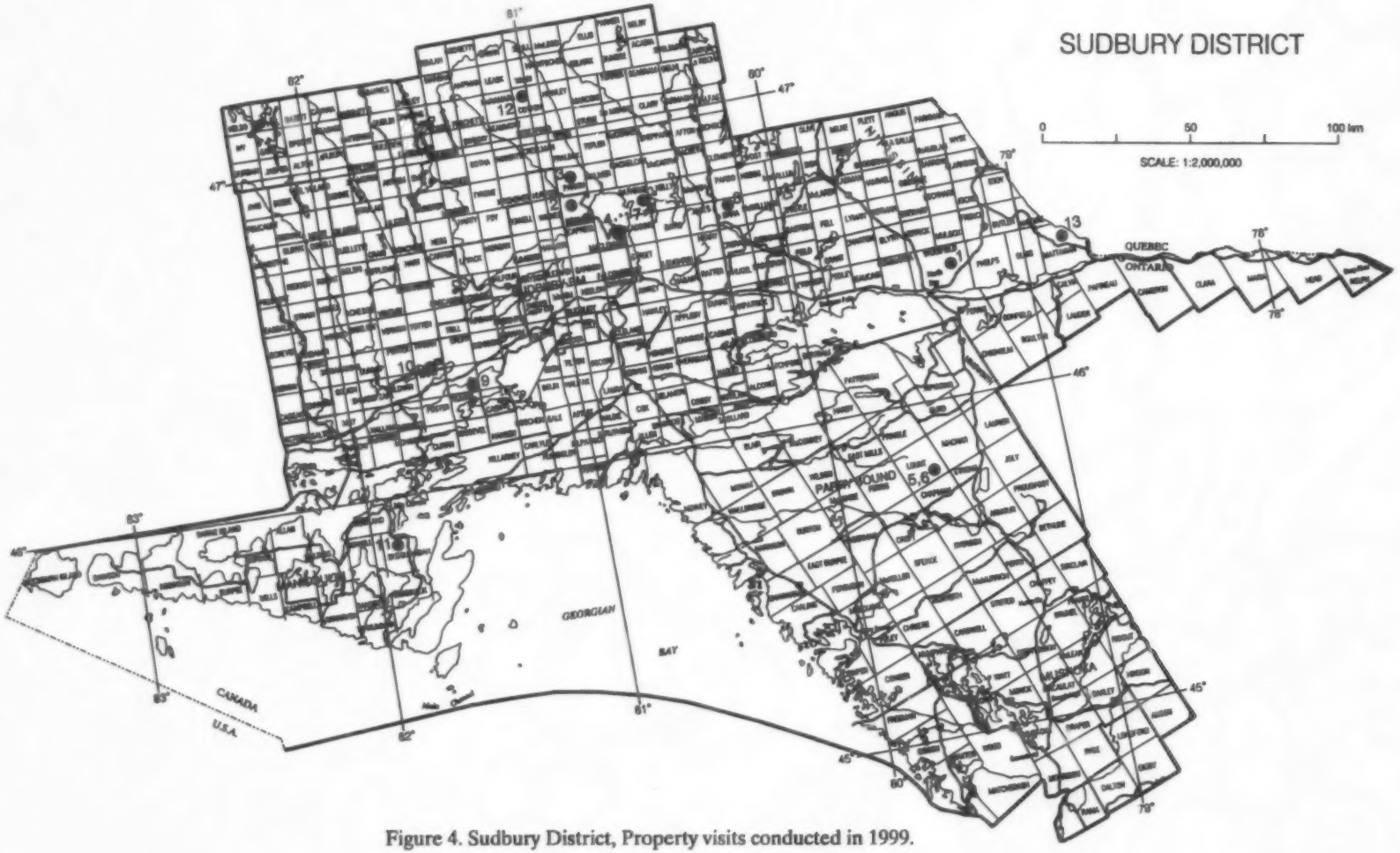

Figure 4. Sudbury District, Property visits conducted in 1999.

Pegmatites are coarse-grained igneous intrusive rocks that generally occur as dikes or sills. In Ontario, they tend be clustered in 1 of 7 groupings or pegmatite fields based on geographic location, age, and source of magma. The common economic minerals found in pegamtites include feldspar, quartz, mica, beryl, columbite-tantalite, lithium minerals, corrundum, cassiterite, molybdenite, uranium minerals, rare earth minerals, pollucite, zircon, nepheline, tourmaline, and gemstones. (Hewitt 1967).

Production from the Mattawa pegmatite field was realized at 21 locations, however, this was usually less than 250 tons per deposit. Historical production occurred between 1925 and 1927, with a minor period of activity in the late 1940's. Alkali (pink) feldspar and mica (muscovite and biotite) were, with few exceptions, the main minerals produced. Feldspar is used in a variety of products including glass, ceramics, and fillers, whereas the mica was utilized for its electrical properties. Exceptionally large sheets of muscovite were extracted from the Purdy mica mine in Mattawan Township, 12 km east of the Gaudette property. In the last decade, J-M Janveaux extracted soda spar (albite var. cleavlandite) from a series of en echelon pegmatite dikes near Kearney Lake, also in Mattawan Township. Attempts weremade to recover albite from the old workings of the Purdy mica mine, the material being considered waste at the time of mica production. The material is used in high-strength ceramics.

The area of the Gaudette occurrence is regionally underlain by rocks of the Tomiko Terrain of the Central Gneiss Belt of the Grenville Structural Province. These rocks are typically paragneisses with an abundance of metasedimentary units compared to other adjacent terrains. These have in turn been intruded by several granitic plutons (Easton 1992).

The Gaudette pegmatite has been intruded into biotite-feldspar paragneiss. The dike strikes 270° and dips 65 to 70° south. The gneissosity of the host rock is also 270°, similar to other structural trends in the Mattawa area. The dike is approximately 20 m wide and zoned. At the contact with the paragneiss, a medium- to coarse-grained pegmatitic phase of alkali feldspar, biotite, and quartz is observed to be from 1.5 to 3 m wide. This is followed by a relatively thin (1 m) unit of massive, coarse-grained alkali feldpar with characteristic perthitic texture (microcline). Minor development of biotite along crystal cleavage planes was also observed. This zone is in turn followed by a plagioclase feldspar zone that grades into a zone characterized by quartz-feldspar intergrowth (graphic zone) with a quartz core. For the most part, the quartz is white, translucent, and coarse grained. Two pods of transparent quartz, each up to 1 m wide are present in the core of the pegmatite. The plagioclase-graphic-quartz zone varies from 10 to 15 m wide (Figure 5).

Figure 5. Cross-section of the Gaudette pegmatite Lot 34, Concession V, Mattawan Township, looking west.

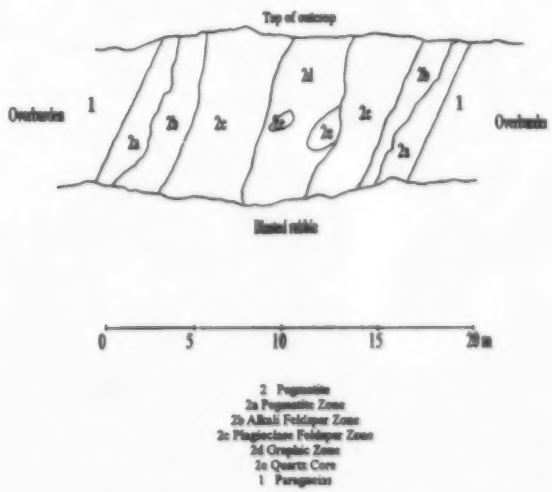

Table 11. Assay results from surface sampling, Gaudette pegmatite (Ontario Geoscience Laboratories, 2000).

	SiO_2	Al_2O_3	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	TiO_2	Fe_2O_3	LOI	TOTAL
Units	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%
Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	N/A
MC-99-42	98.31	0.44	N.D.	N.D.	0.01	0.02	0.01	N.D.	0.01	N.D.	0.13	98.93
MC-99-43	96.96	0.63	N.D.	N.D.	N.D.	0.01	0.01	N.D.	0.01	N.D.	0.10	97.72
MC-99-44	100.14	0.58	N.D.	N.D.	N.D.	0.03	0.15	0.01	0.01	0.01	0.11	101.03
MC-99-45	98.77	0.91	N.D.	0.01	0.02	0.04	0.02	N.D.	0.01	0.26	0.15	100.19
MC-99-46	97.94	0.87	N.D.	N.D.	N.D.	0.02	0.01	N.D.	0.01	N.D.	0.14	98.98

Sample Descriptions
MC-99-42 – clear, transparent quartz from pegmatite core.
MC-99-43 – white, opaque quartz near pegmatite core.
MC-99-44 – graphic zone.
MC-99-45 – clear, transparent quartz from pegmatite core.
MC-99-46 – graphic zone.
N.D. – not detected.

Rolston Silica Property – Sheguiandah Quarry

Silica is the most common rock-forming compound, which amounts to 61% of the earth's crust. Pure silica is rare, and has many industrial uses. It is a major component in the manufacture of silicon carbide abrasives, ferrosilicon, glass, silicon metal alloys, and of silicon based electronic products. Less pure silica is used as flux in the smelting of base metal sulphides.

The Sheguiandah silica quarry is located in the southeast corner of Howland Township, Manitoulin Island (UTM 429332E, 5083231N). The property is accessible by road south from Little Current on Highway 6 for a distance of approximately 9 km, then east on an all weather gravel road for a distance of 400 m. The quarry is on a ridge which trends 075° and rises 55 m above the level of Lake Huron. Rolston Quarry Incorporated currently owns the property (Figure 6).

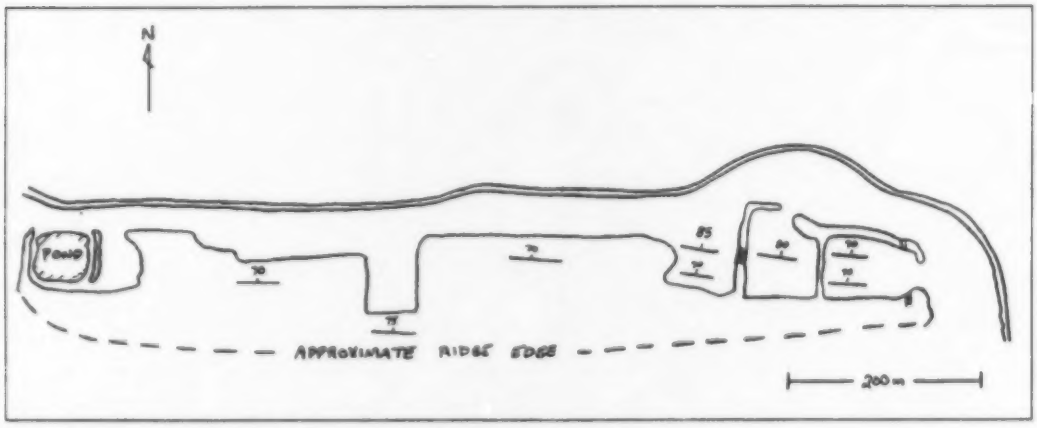

Figure 6. Sketch map of the Sheguiandah silica quarry, Howland Township.

The quarry, which is developed a series of benches over an area about 150 m wide and 1000 m long, was first operated by Manitoulin Quartzite Limited in 1927to 1945, producing 62 128 tons of lump silica valued at $2 689

390 (Hewitt 1963). In the 1950's, Canadian Silica Corporation Limited also produced several million dollars worth of silica (Card 1969).

REGIONAL GEOLOGY

The rocks of the Manitoulin area were formed by a variety of geological processes during the Paleoproterozoic and Paleozoic eras. Ranging in age from approximately 2.6 Ga to less than 0.5 Ga, they are primarily clastic metasedimentary and metavolcanic rocks of the Paleoproterozoic Huronian Supergroup. These rocks were affected by several deformational-metamorphic events, and folded and faulted to nearly vertical positions. They were subsequently intruded by a variety of mafic dikes and felsic plutons (Card, 1978).

Photo 1. Easternmost quarry bench at Sheguiandah silica quarry, Howland Township.

Flat-lying Paleozoic sedimentary strata cover the majority of Manitoulin Island. These beds have a shallow dip (less than 5°) south and unconformably overlie older Paleoproterozoic Huronian Supergroup metasedimentary rocks (Card 1978). Ordovician strata consisting of limestones, dolostones, and shales occur on the north side of the island and underlie approximately 25% of the land area. Silurian strata, consisting of dolostones and some shales, occupy the remainder of the island.

The Paleoproterozoic Huronian Supergroup consists of 4 groups, which in ascending stratigraphic order are the Elliot Lake, Hough Lake, Quirke Lake, and Cobalt groups. The latter 3 groups form 3 sedimentary cycles of conglomerate, overlain by mudstone, siltstone, or carbonate, capped by coarse, cross-bedded sandstone and quartz-arenite.

The Cobalt Group is the uppermost sedimentary cycle of the Paleoproterozoic Huronian Supergroup exposed on Manitoulin Island, and comprises 4 formations: the Gowganda, Lorrain, Gordon Lake, and Bar River formations. The group extends from Sault Ste. Marie through to Kirkland Lake in northeastern Ontario, and into northwestern Quebec. The Gordon Lake and Bar River formations, however, have a more limited aerial extent.

The Bar River Formation is a sequence of white orthoquartzite, quartz arenite, and hematite-bearing sandstone and siltstone at least 900 m thick that occurs at the top of the Cobalt Group. The ridge on which the Sheguiandah Quarry occurs is one of 8 monadknocks of Bar River Formation rocks which extend up through the flat-lying Paleozoic strata in northern Sheguiandah and southern Howland townships.

Rocks from the Bar River Formation were previously correlated with those from the Lorrain and Mississagi formations in the Killarney area (Quirke and Collins 1930). However, as they lie in normal stratigraphic order above the Gordon Lake Formation, they correspond to Collins (1925) "Upper White Quartzite", which Frarey (1967) formally named the Bar River Formation.

According to Card (1978), quartzite of the Bar River Formation is similar to that of the upper part of the Lorrain Formation. It consists mainly of rounded, well-sorted, fine- to medium-grained (0.1 to 0.3 mm) quartz (95%) with recrystallized silica cement and minor amounts of muscovite and accessory hematite, zircon, tourmaline, and monazite. Interbeds and shear zones contain minor amounts of talc, chlorite, and amphiboles. Sedimentological features include massive bedding, cross-beds, and ripple marks (Bennett, Dressler, and Robertson 1991). Sandstone in the upper parts of the Mississagi, Serpent, Lorrain, and Bar River Formations are submature to mature rocks, and were probably deposited in a turbulent environment where winnowing was moderate to strong. Card (1976b) concluded that the mature sands of the Lorrain and Bar River Formations were deposited in a near-shore, coastal shelf environment during cyclically repeated marine transgressions and regressions.

SHEGUNIANDAH QUARRY

The silica at the Sheguiandah quarry consists of white, bedded quartzite. Individual quartzite beds range from approximately 2 to 40 cm thick. They strike approximately west and have an average dip of 75° north. Grading was not observed within the quartzite and therefore determination of tops was not possible. Some of the bed surfaces contain slickensides indicating a fair amount of shearing between bed planes. Hematite staining increases towards the west end of the quarry. This staining is of minor significance and is not pervasive throughout much of the quartzite. Massive, smoky-coloured quartz occurs in proximity to faulted diabase dikes. Whether the smoky quartz is of igneous origin (intruded with the dike) or simply recrystalized during faulting of the already existing quartzite is undetermined. Analyses of composite chip and grab samples from the Sheguiandah Quarry are given in Table 12.

Table 12. Assay results from composite grab and chips samples, Sheguindah silica quarry (Ontario Geoscience Laboratories, 1963, 1999).

Sample	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	TiO_2	Na_2O	K_2O
60-1	99.09	0.37	0.07	0.02	0.02	0.08	0.05	<0.05
60-3	98.05	0.97	0.32	0.12	0.09	0.10	0.05	<0.05
61-1	99.17	0.37	0.05	0.02	0.02	0.03	0.04	<0.05
61-2	98.46	0.92	0.10	0.08	0.04	0.06	0.04	<0.05
61-3	99.27	0.26	0.05	0.02	0.02	0.04	0.04	<0.05
61-4	99.20	0.33	0.05	0.02	0.02	0.04	0.04	<0.05
99-EC-01	99.04	0.62	0.05	<0.01	<0.01	0.04	0.01	0.08
99-EC-02	98.86	0.74	0.08	<0.01	0.01	0.05	0.02	0.09

In the northeast part of the quarry, talc schist is interbedded with the quartzite. This green-coloured, fine-grained schist is well foliated and occurs as thin (5 to 35 cm wide) beds between quartzite beds. Quartz nodules and veins, as well as crenulation cleavage can be observed within individual schist samples. This is an indication of fairly intense deformation.

Two chlorite schist dikes up to 10 m wide cut the quartzite beds. The dark green, brittle rocks (fault gouge) with rusty weathering were probably diabase prior to faulting and metamorphism of the area (Photo 2). The dikes have sharp contacts with the surrounding quartzite and trend 295° and 355°.

Photo 2. Five-meter wide section of faulted diabase dyke, Sheguiandah silica quarry, Howland Township.

RECOMMENDATIONS FOR EXPLORATION

The Sudbury District is underlain by a large variety of geological environments that includes the Superior, Southern, and Grenville provinces, and Paleozoic limestones and dolostones on Manitoulin Island.

In the past year, exploration efforts have been focussed on three fronts: namely, PGE, Offset dikes, and the Sudbury Breccia Belt. The results of some of these exploration programs are detailed above in the "Exploration Activity" section.

The Huronian-Nipissing Magmatic Province was emplaced in two distinct magmatic episodes. The first phase generated early Huronian Supergroup intrusive bodies such as the East Bull Lake, Agnew, and River Valley intrusions (ca. 245 Ga). The second phase produced Nipissing Gabbro intrusions (ca. 2.22 Ga) that were emplaced within Huronian Supergroup sedimentary rocks.

The early intrusions are essentially composed of differentiated leucogabbroic and gabbronoritic rocks and contain significant PGM mineralization, as most recently discovered by a number of junior exploration companies. There are two distinct styles of sulphide mineralization, namely: (1) disseminated magmatic sulphides, particularly within inclusion leucogabbronorite, and (2) disseminated to massive, structurally controlled sulphides. Both types are enriched in platinum, palladium, copper, nickel, and gold. However, the magmatic sulphides are more strongly enriched in PGE.

The Nipissing diabase intrusions consist of rocks ranging from chilled diabase, gabbro, gabbronorite, and vari-textured gabbro, to pegmatitic gabbro. East of Wanapitei Lake, PGE are present in significant quantities in magmatic massive sulphides at the Rathbun Lake occurrence in the Wanapitei intrusion, and in disseminated sulphides, particularly along the contact with the Huronian Supergroup metasedimentary rocks in the Kukagami

Lake and Chiniguchi intrusions. South and west of Sudbury in the Penokean Fold Belt, PGM occurrences are known to occur in disseminated sulphides within the intrusion and along the contacts with the host rocks.

With regard to the Sudbury Igneous Complex, there appears to be no lack of interest in scouring footwall terrain. Offset dikes, which are considered to host high-grade Ni-Cu deposits, have been extended recently in the west and southwest of the Sudbury Structure. Zones of Sudbury Breccia are also being considered as an area of preferential ore emplacement, and are geologically analogous to the host rock of the Creighton and Frood-Stobie orebodies.

The reader is also directed to Ontario Geological Survey Open File Report 6000, Summary of Field Work 1999, chapters 30, 31, and 33 for greater detail on other properties and analytical results.

Table 13. Publications received by the Sudbury District office in 1999.

Title	Author	Type and Year of Publication
Canadian Mines Handbook, 1999-2000	Giancola, D.	Southham Mining Publications Group, 1999
Bear Encounter Survival Guide	Shelton, J.G.	James Gary Shelton, 1994
Bear Attacks: The Deadly Truth	Shelton, J.G.	James Gary Shelton, 1998
Developments in Petrology 15: Layered Intrusions	Cawthorn, R.G.	Elsevier Science B.V., 1996
Ontario Mineral and Exploration Statistics 1998	Ontario Ministry of Northern Development and Mines	Ministry of Northern Development and Mines, 1999
Alteration and Alteration Processes Associated With Ore-Forming Systems	Lentz, D.R.	Geological Association of Canada Short Course Notes Volume 11, 1994
Trace Element Geochemistry of Volcanic Rocks: Applications for Massive Sulphide Exploration	Wyman, D.A.	Geological Association of Canada Short Course Notes Volume 12, 1996
Dynamic Processes in Magmatic Ore Deposits and Their Application to Mineral Exploration	Keays, R.R., Lesher, C.M., Lightfoot, P.C., and Farrow, C.E.G.	Geological Association of Canada Short Course Notes Volume 13, 1999
Wallbridge Mining Company Limited Annual Report 1998	Wallbridge Mining Company Limited	Annual Report 1998, 1999
Falconbridge Limited Annual Report 1997: Investing in Value	Falconbridge Limited	Annual Report 1997, 1998
Ontario's Living Legacy – with Land Use Designations Map	Ontario Ministry of Natural Resources	Land Use Strategy, July 1999
GAC/MAC Joint Annual Meeting, Sudbury 1999 Abstract Volume 24	Geological Association of Canada/Mineralogical Association of Canada	Abstracts, 1999
Sudbury Ni-Cu-PGE Deposits – South Range (A1) and North Range (B1)	Fedorowich, J. (B1) and Morrison, G. (A1)	GAC/MAC Joint Annual Meeting 1999, Field Trips A1 & B1 Guidebook, 1999
Transects Across the Grenville Front Near Sudbury, Ontario	Easton, R.M., Davidson, A. and Murphy, E.	GAC/MAC Joint Annual Meeting 1999, Field Trip A2 Guidebook, 1999
World-Class Archean Vein Gold Deposits of the Porcupine Camp, Timmins, Ontario	Brisbin, D. and Pressacco, R.	GAC/MAC Joint Annual Meeting 1999, Field Trip A3 Guidebook, 1999

Table 13, cont'd.

Tectonics of Impact Basin Formation: The Sudbury Example	Butler, H.R. and Spray, J.G.	GAC/MAC Joint Annual Meeting 1999, Field Trip A4 Guidebook, 1999
Quaternary Geology and Geomorphology of the Sudbury Region	Bajc, A.F. and Barnett, P.J.	GAC/MAC Joint Annual Meeting 1999, Field Trip A5 Guidebook, 1999
Environmental Geology and Land Reclamation History of Sudbury	Bouillon, D., Heale, E., Yearwood, P. and Hall, G.J.H.	GAC/MAC Joint Annual Meeting 1999, Field Trip A6 Guidebook, 1999
Cobalt, A Historic Silver Mining Camp	Ireland, J. and Grabowski, G.	GAC/MAC Joint Annual Meeting 1999, Field Trip A8 Guidebook, 1999
Ordovician and Silurian Fossils and Strata of the Lake Timiskaming Outlier	Copper, P. and Armstrong, D.K.	GAC/MAC Joint Annual Meeting 1999, Field Trip B2 Guidebook, 1999
Late Archean Rock Types and Controls on Gold Mineralization in the Southern Abitibi Greenstone Belt of Ontario	Ayer, J., Berger, B., Johns, G., Trowell, N., Born, P. and Mueller, W.U.	GAC/MAC Joint Annual Meeting 1999, Field Trip B3 Guidebook, 1999
Actualistic and Nonactualistic Precambrian Sedimentary Styles: Examples From the Proterozoic North of Lake Huron	Long, D.G.F., Young, G.M., Rainbird, R. and Fedo, C.	GAC/MAC Joint Annual Meeting 1999, Field Trip B5 Guidebook, 1999
Overburden As A Media for Kimberlite, Base Metal and Gold Exploration, Wawa Region, Northeastern Ontario	Morris, T.F.	GAC/MAC Joint Annual Meeting 1999, Field Trip B6 Guidebook, 1999
Geology of the Sudbury Structure	Cosec, M.	GAC/MAC Joint Annual Meeting 1999, Field Trip B7 Guidebook, 1999
Hydrothermal Alteration Mineral Assemblages Associated with Volcanic-Hosted Massive Sulphide Mineralization in the Noranda Area, Quebec	Santaguida, F., Gibson, H.L., and Watkinson, D.H.	GAC/MAC Joint Annual Meeting 1999, Field Trip B8 Guidebook, 1999
Solidification Fronts of the Sudbury Melt Sheet	Marsh, B.D. and Zieg, M.	GAC/MAC Joint Annual Meeting 1999, Field Trip B9 Guidebook, 1999
Polystage Convergence and Extension in the Mid- to Lower Orogenic Crust: An Examination of the Central Gneiss Belt, Grenville Province, Along Georgian Bay	Ketchum, J.W.F., Wodicka, N., Culshaw, N.G. and Jamieson, R.A.	GAC/MAC Joint Annual Meeting 1999, Field Trip B10 Guidebook, 1999
New observations related to the mineral potential of the Southern Province and the Grenville Front Tectonic Zone east of Sudbury	Easton, R.M.	Ontario Geological Survey, Open File Report 5976, 1998
Report of Activities 1998, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	Blackburn, C.E., Hinz, P., Storey, C.C., Kosloski, L. and Ravnaas, C.B.	Ontario Geological Survey, Open File Report 5987, 1999
Report of Activities 1998, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North and Sioux Lookout Districts	Mason, J.K., Seim, G., White, G.D., O'Brien, M.S., Farrow, D., Walden, A. and Komar, C.	Ontario Geological Survey, Open File Report 5988, 1999
Report of Activities 1998, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	Schnieders, B.R., Scott, J.F., Smyk, M.C. and O'Brien, M.S.	Ontario Geological Survey, Open File Report 5989, 1999

Table 13, cont'd.

Report of Activities 1998, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M.H., Pressacco, R., Wilson, A.C., Draper, D.M., Hope, P., Morra, P.M. and Egerland, D.C.	Ontario Geological Survey, Open File Report 5990, 1999
Report of Activities 1998, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., Guindon, D.L., and Gosselin, S.D.M.	Ontario Geological Survey, Open File Report 5991, 1999
Results of regional humus and till sampling in the eastern part of the Shebandowan greenstone belt, northwestern Ontario	Bajc, A.F.	Ontario Geological Survey, Open File Report 5993, 1999
Surficial Geology of the Regional Municipality of Sudbury	Barnett, P.J. and Bajc, A.F.	Ontario Geological Survey, Preliminary Map P. 3399, scale 1:100 000, 1999
Summary of Field Work and Other Activities 1999	Ayer. J.A., Baker, C.L., Kelly, R.I., Stott, G.M., and P.C. Thurston	Ontario Geological Survey Open File Report 6000, 1999
Aggregate Resources Inventory of The Highway 17 Corridor between the Wahnapitae Area and Sturgeon Falls	Rowell, D.J.	Ontario Geological Survey Aggregate Resources Inventory Paper 174, 1999
Precambrian geology, Bracebridge area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3411, scale 1:50 000, 2000
Precambrian geology, Huntsville area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3413, scale 1:50 000, 2000

In addition, the office receives copies of the Sudbury Star, The Globe and Mail, Canadian Mining Journal, CIM Bulletin, The Northern Miner, Nickel, Economic Geology and the Society of Economic Geologists Newsletter.

Table 14. Mineral deposits not being mined in the Sudbury District in 1999.

Abbreviations

AF	Assessment Files	MLS	Mining Lands, Sudbury
CMH	Canadian Mines Handbook	MR	Mining Recorder
GR	Geological Report	NM	The Northern Miner
MDC	Mineral Deposit Circular	OFR	Open File Report
MDIR	Mineral Deposit Inventory record	PC	Personal Communication

Deposit Name/NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Angus deposit (MDIR 31L14SW00014)	Ti, Fe	141 000 000 T @34.58% Fe, 15.64% TiO2 to 1000 feet deep	Titan Iron Mine Ltd.	AF Angus Tp.	Inactive patents
Bissett Creek deposit (MDIR 31L01SE00002)	flake graphite	26 038 000 T @ 1.86% flake graphite; 4744 000T @ 2.99% graphite	North Coast Industries Ltd.	AF Maria Tp.	Active staked claims

Table 14, ont'd.

Deposit Name/NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Brazeau Prospect (MDIR 31L02NE0010)	Va, Ti, Fe, (garnet)	110 000T @0.76% V_2O_3, 7.9% TiO_2, 35.2% Fe for two lenses to 100 ft.; 950 000 T for 6 lenses to 100 ft.	A. Clark	MRC 11	Active
Burwash Lake Prospect (MDIR 41P02SW00006)	Fe	15 possible pit areas outlined containing indicated or inferred reserves of 450,000 tons per vert. foot, aver. 20.7 % Fe. Potential tonnage est. @ 100 million tons. Preliminary concentration tests – concentrate grading 68.2% Fe, 5.0% SiO_2 with recovery of 93%	Ownership unknown	MRC 11	Inactive
Butler (Crocan Lake) prospect (MDIR 31L11SE00012)	kyanite	50 000 000 T @13-17% kyanite	Kyanite Mining Corporation	AF Butler Tp.	Active leases
Butler Vermiculite deposit (MDIR 31L11SE00003)	vermiculite	"A" zone: 144 000T @50-90% vermiculite	Consolidated Richland Mines Incorporated	n/a	Active
Cummings Lake Prospect (MDIR 41I16NE00036)	Fe	327.9 million tons @ 26.9% soluable Fe total	Rio Algom Ltd.	MRC 11	Inactive, underground exploration and bulk sampling
Errington/Vermilion Mines (MDIR 41I11SW00006)	Zn, Cu, Pb	4.4 million tons @ 1.33% Cu, 1%Pb, 4%Zn; 9 million tons @ 1.14%Cu, 1%Pb, 3.8%Zn (drilling by Falconbridge Ltd. has increased these figures)	Falconbridge Limited, Royal Oak Mines Inc.	MRC 12	Inactive, past producer
Falcon Gold (MDIR 41I10SE00003)	Au	Estimate 60,000 tons @0.23 oz/Au ton	Pentland Firth Ventures Ltd.	E. Stringer, prospector, PC 1995	Inactive, underground development 1900's
Fostung (Texas) (MDIR 41I04NE00036)	W, Mo	F33-10 zone, 100,000 tonnes/vertical m @ 0.214% WO_4 with 81,200 tonnes/vertical m @ 0.23% WO_4 and 0.016 % MoS_2	Breakwater Resources Limited	Ginn, R. M. and Beechan, A. W., CIM Bulletin, V. 77, No. 863, p. 60, 1984	Inactive, extensive work by Sulpetro Minerals Limited in late 1970's, early 1980's
Geneva Lake Mine (MDIR 41I13SE00002)	Cu, Pb,Zn (Ag, Au)	170,000 T @ 11% Zn. (Small production - 80,588 tons high grade ore)	Natural Resource Holding & Consulting Inc.	Properties with Mineral Inventories, Ontario, Canada, February 1996	Inactive, past-producer 1940s
Graphite Lake Mine (MDIR 31E11NE00004)	graphite	Sheehan zone remains unmined, 6.4 million tons proven @ 2% graphitic carbon (part of 30 million tons, p, p, & p)	Applied Carbon Technology Inc.	OFR 5892	Inactive, past producer, closed in 1994 (possibly '93)

Table 14, cont'd.

Deposit Name/NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Kidd Copper (MDIR 41I06NW00012)	Ni, Cu, Co, PGM	Estimated 498,000 tons averaging 0.71% Cu, 0.62% Ni in Robinson Zone (No. 1 Shaft area); 275,000 tons @ similar grade in the Rosen Zone (No. 2 Shaft area)	J. P. Sheridan	Canadian Mines Handbook, 1969-70	Inactive, past producer, 1966 to 1968
Lawson Quarry (MDIR 41I04SE00014)	Si	Significant but unpublished	Inco Limited	n/a	Active, Bar River Form. orthoquartzite; past producer of smelter flux
Parkin Calcite (MDIR 41I15SW00041)	$CaCO_3$	147,460 probable and possible tons of "good, fair and poor" calcite	J. Brady	AF Parkin SP025	Inactive
Spanish River Mine (MDIR 41I05SW00014)	Cu, PGMs	Estimate 0.9 million tons @ 0.5% Cu + PGM	D&H Consulting Services Inc.	as above	Inactive, past-producer 1969-70. 14,500 T stockpile on surface
Stralak Deposit (MDIR 41I13SE00044)	Zn, Cu, Pb (Ag)	800,000 tons @ 4% Zn, 0.3%Cu, 0.5%Pb, 2.0 opT Ag	Stralak Resources Inc.	as above	Inactive, last active 1993, diamond drilling
Wikwemikong (MDIR 41H13SE00012)	dolomite	Undetermined but possibly significant	Wikwemikong Unceded Indian Reserve	n/a	Inactive, some widely spaced diamond drill holes. Feasibility and several reports

OGS ACTIVITIES AND RESEARCH BY OTHER ORGANIZATIONS

The geology of the Sudbury Structure, which includes the Sudbury Igneous Complex and its mineral deposits attracts research interest worldwide, even after 110 years of commercial production and countless treatises. Efforts are continually being made by the Sudbury District Geologist office to update an index of geoscientific papers specifically focused on the enigmatic Sudbury Structure.

Many geoscience research organizations and universities in the United States and Canada have ongoing research activities in the area. A few of note are mentioned in the following paragraphs. The Sudbury District Geologist office is an invaluable starting point for past research, present activities, and logistics when contemplating work in the area.

M. Easton of the Precambrian Geoscience Section of the Ontario Geological Survey continued his study on the geology and copper-platinum group element mineral potential of Dana and Crerar townships in the River Valley area.

S. Jobin-Bevans continued working on his doctoral thesis at The University of Western Ontario in co-operation with Laurentian University. His thesis will examine the potential for economic concentrations of Ni-Cu-PGE hosted in

Nipissing gabbro. Geological mapping, as well as lithogeochemical sampling of specific occurrences will be completed. One of the aims of this study is to develop a useful exploration model for gabbroic ores that may be used by prospectors and junior exploration companies.

N. Tardif of the Sedimentary Geoscience Section of the Ontario Geological Survey commenced a regional till sampling program in the River Valley area to determine the occurrence and abundance of platinum, palladium, and gold in subglacial till.

M. Deslauriers, Laurentian University, is studying the paragenesis and metallogenesis of footwall copper mineralization at the McCreedy East 153 Deep Copper Zone.

J. Hrominchuk, Laurentian University, is studying the geology, stratigraphy, and copper-platinum group element mineralization of the River Valley intrusion in Dana township.

S. Kormos, Laurentian University, is studying the metal distribution within the 39 Zone at the Strathcona Mine.

A. Lauzon, Laurentian University, is studying the geological relationship with respect to recoverable reserves of the Sudbury Igenous Complex.

A. Lock, Laurentian University, is modelling Ni-Cu-PGE with respect to the host Paleoproterozoic Huronian Supergroup rocks.

G. Moure, Laurentian University, continued the study of the mineralogy and petrology of inclusions within the Copper Cliff Offset. This may have implications to the localization of Ni-Cu-PGE ore within the Sudbury Igneous Complex, as well as other Proterozoic, differentiated mafic intrusive complexes.

M. Moore, Laurentian University, continued with her studies of the Levack and Fraser mines in the North Range of the Sudbury Igneous Complex.

M. Reich, Laurentian University, continued his examination of compositional changes in phyllosilicates at the Inco Limited Whistle Mine. Results of this study may have direct benefits to improved ore recovery at several proposed open pit deposits.

D. Rogers is studying the metal enrichment within the Onwatin Member of the Whitewater Group.

Under the direction of J. Spray of the University of New Brunswick Sudbury Research Program, A. Murphy, J. O'Conner, R. Scott, M. Tuchscherer, and C. Wood conducted research into the geological and regional setting of Offset dikes emanating from the Sudbury Igneous Complex.

ACKNOWLEDGEMENTS

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.